TO: All Site Personnel

FROM: KH-Ecology Group

DATE: February 19, 2004

SUBJECT: USE OF PART I OF THE PROGRAMMATIC BIOLOGICAL ASSESSMENT FOR THE RFETS

This document covers selected activities that may occur at RFETS and have potential to impact the Preble's meadow jumping mouse (a federally listed threatened species) or the current Preble's mouse protection areas. On January 30, 2004, the U.S. Fish and Wildlife Service concurred that these activities may be conducted at RFETS. Although concurrence has been received for the specific projects listed in the document, contact your Environmental Manager and the KH Ecology Group prior to commencement of projects authorized within this Part I. The K-H Ecology Group will provide additional information on the minimum best management practices required for the activity under this approval. Activities occurring in Preble's meadow jumping mouse protections areas that are not explicitly outlined in this Part I are not authorized.

For additional information please contact your Environmental Manager or the KH Ecology Group individuals indicated below:

Jody Nelson x2231
Karin Kiefer x3560
Andrew Rosenman x3687

Thank you.

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PROGRAMMATIC BIOLOGICAL ASSESSMENT FOR DEPARTMENT OF ENERGY ACTIVITIES AT THE ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

PART I: Activities with "No Effect", or that "May Affect, but Not Likely to Adversely Affect" threatened or endangered species.

January 2004

U.S. Department of Energy
Rocky Flats Field Office
Golden, Colorado

January 2004
Revision 10
Classification Exemption CEX-105-01

Prepared for
US Department of Energy
Rocky Flats Field Office
Golden, Colorado 80402-0464

By
Kaiser-Hill Company, LLC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215-5599

cliff

IN REPLY REFER TO:
ES/CO: Rocky Flats
MS 65412 LK

JAN 30 2004

Mr. Cliff Franklin
Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, CO 80403-8200

Post-it™ Fax Note 7671	Date	# of pages ▶ 2
To A Rossman	From C Franklin	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 8482	Fax #	

Dear Mr. Franklin,

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), we have reviewed the Rocky Flats Programmatic Biological Assessment, Part One with your letter of December 18, 2003, and its effects on the federally-listed Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's). The projects, as proposed, may affect wetlands or other riparian habitats.

Part One of your Programmatic Biological Assessment contains descriptions and locations for groundwater monitoring, soil sampling, surface water monitoring, Building 124 water treatment, Building 891 combined water treatment facility operations, sanitary waste water operations, sanitary waste disposal, routine infrastructure and support activities, utilities deactivation, waste storage and removal, building and structure decommissioning and demolition in the Industrial Area (IA), present landfill, recycling of concrete, IA revegetation, and routine soil remediation projects. Based upon your project descriptions and locations, the Service concurs that these projects will not affect Preble's or its habitat.

Additionally, based on the project information and locations provided on ecological monitoring, air quality monitoring, routine pond operations, routine road maintenance, weed and vegetation management, Well Abandonment and Replacement Program (WARP), removal of concrete pads from abandoned wells, subsurface soil sampling, groundwater treatment system monitoring, trash removal from the Buffer Zone, B-4 Pond building removal, C-1 Pond rip rap pile removal, Walnut Creek dirt pile removal, pipeline removal, fence and t-post removal, gravel and riprap storage area, guard rails along roads, power pole and power line removal, security force Buffer Zone activities, South Interceptor Ditch maintenance, temporary surface water flumes, and Buffer Zone concrete/incinerator removal projects, the Service concurs that these activities are not likely to adversely affect Preble's or its habitat.

Due to changes in scheduling, or in the project design, portions of several projects have already been consulted on separately. The boundary of the Preble's Protection Area was revised in December, 2003, and may now affect some of these projects. Therefore, they have been retained as part of the Programmatic Biological Assessment.

Should any of project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

Should any of your projects not begin within one year of the date of this letter, please contact the Service to discuss any changes in the projects or in site conditions. If the Service can be of further assistance, please contact Amy Thornburg at (303) 966-5777.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: USFWS, Rocky Mountain Arsenal, NWR (Attn: Dean Rundle)
Kaiser Hill, Rocky Flats (Attn: Andrew Rosenman)
Professional Environmental Group, Rocky Flats (Attn: Jody Nelson)

Ref: Alison/Rocky Flats/PBS Part One Concurrence/012904

Contents

List of Figures

Acronyms and Abbreviations

ATV	All Terrain Vehicle
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best Management Practices
BO	Biological Opinion
BZ	Buffer Zone
CDPHE	Colorado Department of Health and Environment
CDNR	Colorado Department of Natural Resources
CDOW	Colorado Division of Wildlife
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CNHP	Colorado Natural Heritage Program
D&D	Decommissioning and demolition
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
GMP	Groundwater Monitoring Program
IA	Industrial Area
ITS	Interceptor Trench System
LHSU	Lower HydroStratigraphic Unit
MOA	Memorandum of Agreement
MSL	Mean Sea Level
MST	Modular Storage Tanks
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Lab
OU	Operable Unit
PBA	Programmatic Biological Assessment
PWTS	Process Waste Transfer System
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFNWR	Rocky Flats National Wildlife Refuge
RSOP	RFCA Standard Operating Protocol
SEO	State Engineer's Office
SID	South Interceptor Ditch
Site	Rocky Flats Environmental Technology Site
SPPTP	Solar Pond Plume Treatment Project
TSCA	Toxic Substances Control Act
UHSU	Upper HydroStratigraphic Unit
USCOE	U. S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

WARP	Well Abandonment and Replacement Program
WWTP	Waste Water Treatment Plant

1. Introduction

1.1 Background

Rocky Flats Environmental Technology Site (Site, RFETS) is an U.S. Department of Energy (DOE) nuclear industrial facility that has been part of the nationwide nuclear weapons complex since 1951. The Site is located in rural Jefferson County, Colorado, approximately 16 miles northwest of Denver, and 5 miles southeast of Boulder (Figure 1). The Site covers approximately 6,300 acres, of which approximately 5,900 acres forms an undeveloped Buffer Zone (BZ) around the central industrialized portion (Industrial Area; IA). The original 1951 land purchase included approximately 2,500 acres of rangeland, which was expanded by an additional 4,030 acres from private ranches between 1974-1976 (some 280 acres were later allocated to the National Renewable Energy Laboratory, NREL). The Site adjoins undeveloped rangelands that are being encroached upon by housing developments on the northeast and southeast. Public open-space lands border the Site to the north, east, and northwest. Sand and gravel mining activities, light industry, and other potential sites for industrial/commercial use are present on the western edge of the Site at a few locations. Jefferson County has zoned approximately 750 acres of the western BZ for surface mining. The Colorado Division of Mines and Geology has issued a reclamation permit for these lands.

The original mission of this DOE facility was the manufacture of nuclear weapons components. After the end of the Cold War, nuclear weapons production was stopped. In 1996**,** the U.S. Department of Energy, Rocky Flats Field Office (DOE), the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) executed the Rocky Flats Cleanup Agreement (RFCA). RFCA is the Federal Facility Compliance Agreement and Consent Order negotiated pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and Colorado Hazardous Waste Act (CHWA). RFCA provides the regulatory framework for attaining the goal to achieve accelerated cleanup and Site closure in a manner that is safe to workers and the public, and protective of the environment. At this time the Site is undergoing cleanup and closure. From now through late 2005, the buildings and other structures at the Site will be decommissioned and demolished, with the disturbed areas seeded with native plant species.

After Site cleanup and closure is completed, the Site will become the Rocky Flats National Wildlife Refuge (RFNWR) to be managed by the U.S. Fish and Wildlife Service (USFWS).

1.2 Purpose

The DOE developed this Programmatic Biological Assessment (PBA) as part of the Section 7 consultation requirements of the Endangered Species Act of 1973, as amended (ESA). The DOE is the action agency requesting the formal consultation with the USFWS. This document is Part I of two parts of the PBA that will address the potential for Site activities to affect threatened and endangered species that are protected under the ESA. Part I of the PBA has been prepared to examine impacts from routine, ongoing activities, and specific closure actions that will have either "no effect" or "may affect, but are not likely to adversely affect" on species under consideration in this PBA, which includes the Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*) and its habitat (current protection areas). The current Preble's protection areas at the Site are defined as those areas delineated by the *Preble's Meadow Jumping Mouse Protection Plan* for the Site (DOE 2000; see Appendix A in Part I of the PBA for the Plan and the map). This plan was required under the Memorandum of Agreement (MOA, February 26, 1999) signed between DOE, USFWS, U.S. Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE), and the Colorado Department of Natural Resources (CDNR). The plan was developed based on several years of Preble's mouse trapping, telemetry, and habitat characterization work at the Site. The plan has been submitted several times to the USFWS for concurrence, however, the USFWS has never concurred. Although the plan has never received formal concurrence, it has been cited and used for numerous Biological Assessments (BAs), Biological Evaluations (BEs), and Biological Opinions (BOs) for Site projects. Part II of the PBA addresses actions that "are likely to adversely affect" the species under consideration in this PBA including the Preble's mouse and its habitat (current protection areas). Part II of the PBA also addresses water depletion issues.

There will be no effect from any of the activities listed in Part I of the PBA on the species evaluated, with the exception of the Preble's mouse. Although some activities listed in Part I of the PBA may affect the Preble's mouse, it is unlikely that these activities will adversely affect it.

Unlike most other Section 7 consultations, the DOE activities covered under this PBA are aimed at removing man-made structures in and adjacent to the habitat of the Preble's mouse and re-establishing the native vegetation. This large-scale project differs from most other consultations where private and public agencies are consulting about activities that have permanent impact on the habitat of federally listed species (i.e., residential and commercial development, roads, parking lots, etc.). Instead of encroaching permanently into the Preble's mouse habitat, this project will re-establish and increase the amount of habitat at the Site while largely having only temporary impacts. Thus the long-term benefits will far outweigh the short-term impacts. Because the Site will become a national wildlife refuge these resource values will be protected for future generations.

1.3 Assumptions

This PBA addresses all the potential activities that may occur at the Site through closure that may affect threatened and endangered species, with specific emphasis on the Preble's mouse. However, the fact that a project is listed in this document does not mean that it will necessarily take place. Only projects that are conducted will be mitigated as discussed in the PBA. Mitigation will not occur for projects that are not conducted. The objective of the PBA is to identify all potential projects for the consultation process so that no delays in project schedules will occur. Where specific project plans are not available, the worst case scenarios have been assumed. The projects activities are required to meet regulatory requirements or site closure commitments.

1.4 Responsibilities

Project managers will receive a copy of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. The project managers are responsible to ensure compliance with the requirements and guidelines outlined in the PBA and BO. Projects are responsible to follow and maintain the best management practices (BMPs).

2. Environmental Setting

2.1 Air Quality

Air quality is generally better at the Site than in the urbanized portion of the Denver Metropolitan Area; air emissions are within permitted limits for regulated air pollutants. The principal point sources of criteria pollutants at the Site have been the steam plant boilers. Minor combustion sources include smaller boilers and emergency generators. Fugitive dust is one of the more significant air pollutants at the Site; cleanup and related construction can require dust suppression to control fugitive dust.

Radiological air emissions both on- and off-Site are largely unrelated to Site operations. Most radiation is naturally occurring background radiation from sources such as radon. The annual background dose for Denver area residents is about 418 mrem (more than 1 mrem per day). Radioactive emissions from the Site are principally from contaminated soil, with an annual dose for the nearest most impacted off-Site resident of about 0.1 mrem. Facilities with potential radionuclide emissions are continuously monitored at emission points to ensure that emissions are properly controlled and comply with regulations.

2.2 Surface Water

The Site is situated within the headwaters of two regional drainage basins, Boulder Creek basin and Big Dry Creek basin. Within these basins, three intermittent systems, Walnut Creek, Woman Creek, and Rock Creek, drain the Site (Figure 2).

Walnut Creek is an east-flowing stream that drains the central portion of the Site, including most of the IA. Runoff from the developed area to the drainage occurs faster and with greater volume than under natural conditions. Within Site boundaries, Walnut Creek includes three major branches on-Site, South Walnut Creek, North Walnut Creek, and a northern tributary referred to as the "unnamed tributary." These tributaries converge in the eastern portion of the Site. The North Walnut Creek drainage includes a series of four detention ponds (A-series ponds), constructed for Site runoff control and pollution prevention programs. The South Walnut Creek runoff is controlled through a series of five in-channel detention ponds (B-series ponds).

Walnut Creek is generally dry from July through April based on natural flows, however, it does receive water from pond discharges throughout the year. Pond discharges occur on the average ten times per year and last about fourteen days per discharge.

The Woman Creek drainage is located south of the IA, and includes an area from the Boulder Diversion Canal west of the Site to Indiana Street. The three sources of flow to Woman Creek are precipitation and surface runoff, seepage from Antelope Springs and

lesser seeps, and conveyance flows as a result of water rights agreements. These flows are from Kinnear Ditch, Smart Ditch #1, and Smart Ditch #2.

Woman Creek flows through Pond C-1, and is then diverted around Pond C-2 by the Woman Creek Bypass Canal. Woman Creek flows are either diverted into the Mower Diversion Ditch or proceed in Woman Creek to Indiana Street and off-Site.

Surface water runoff from the southern slope of the IA is collected by the South Interceptor Ditch and conveyed to Pond C-2. Water impounded in Pond C-2 is held for quality analysis, and discharged into Woman Creek below the dam.

Rock Creek is located in the northern portion of the Buffer Zone. It is upstream of the IA, and it is physically separated from the IA by a northeast trending ridge. It was undisturbed by Site activities during operation of the Rocky Flats Plant. Rock Creek is now part of the Rock Creek Preserve, a part of the Site property that is co-managed by DOE and the USFWS. Rock Creek flows off-Site into Coal Creek.

2.3 Groundwater

The Site is located in a regional groundwater recharge area. Recharge occurs primarily from the infiltration of precipitation. Groundwater recharge also occurs from infiltration from stream, ditch, and pond seepage.

Shallow groundwater flow at the Site generally follows the topography of the bedrock surface. Groundwater in the ridge tops generally flows toward the east-northeast. In areas where the ridge tops are dissected by east-northeast trending stream drainages, groundwater flows to the north or south toward the bottom of the valleys. In the valley bottoms, groundwater flows to the east, generally following the course of the stream. Shallow groundwater flow is primarily lateral due to the low permeability of the underlying claystone bedrock.

Two non-hydraulically connected groundwater systems are present at Rocky Flats. The upper unit exists as an unconfined aquifer and the lower unit as a confined aquifer. Aquifer recharge occurs through direct infiltration or percolation, infiltration from surface water when the water table lies below a stream or canal, inter-aquifer leakage, and infiltration from artificial sources, such as detention ponds, surface water impoundment, sewer lines, and dry wells.

The uppermost aquifer or upper hydrostratigraphic unit (UHSU) consists of the unconfined saturated zone, in which unconsolidated and consolidated groundwater-bearing strata are in hydraulic communication. The UHSU consists of Rocky Flats Alluvium, valley-fill alluvium, colluvium, landslide deposits, weathered Arapahoe and Laramie Formation bedrock, and sandstones within the Arapahoe and upper Laramie Formations in hydraulic communication with the overlying unconsolidated surficial deposits. The UHSU exhibits a wide range of hydraulic conductivity, but generally has a

relatively low to moderate hydraulic conductivity. The lower hydrostratigraphic unit (LHSU) consists of the consolidated, unweathered bedrock zone of the Arapahoe and upper Laramie Formations. These formations have less sandstone and more claystones that create an aquitard restricting hydraulic communication with the UHSU. The lower Laramie and Fox Hills Formations comprise a third hydrostratigraphic unit.

The three hydrostratigraphic units are hydraulically separated beneath the IA. The units are thought to converge near the western edge of the Site due to monoclinal folding and erosional proximity.

2.4 Geology

The Site is located along the western margin of the Denver Basin, an asymmetric basin with a steeply east-dipping western flank and a gentle eastern flank. The elevation at the Site is about 6,000 feet above mean sea level (msl), and the upper surface of the alluvium slopes easterly one to two degrees. A monoclinal fold limb exposed west of the Site is the most significant surficial structural feature. Along the west limb of the fold, an angular unconformity exists between the Upper Cretaceous bedrock and the base of the Quaternary Rocky Flats Alluvium.

The stratigraphic sequence that underlies the Site extends from the crystalline Precambrian gneiss, schist, and granitoids at 3,000 feet below msl to the unconsolidated Quaternary deposits at surface about 6,000 feet above msl. Bedrock formations from the uppermost Cretaceous Pierre, Fox Hills, Laramie, and Arapahoe Formations are present at the surface and beneath the Site. The Quaternary Rocky Flats Alluvium and Verdos Alluvium unconformably overlie the Cretaceous Arapahoe and Laramie Formations in the central portion of the Site. The unconsolidated surficial deposits, combined with the weathered portion of subcropping bedrock formations, form the sequence of rocks which have the greatest importance regarding groundwater flow at the Site.

Several Quaternary alluvial formation pediment covers have been identified in the vicinity of the Site. The Rocky Flats Alluvium is an unconsolidated deposit derived from quartzites and granites of the Coal Creek Canyon provenance west of the Site. The deposit diminishes from west to east with a thickness ranging from about 100 feet to less than one foot. In the central portion of the Site, the deposit is about 15 to 25 feet thick. The Rocky Flats Alluvium is a heterogeneous deposit dominantly composed of angular to subrounded, poorly-sorted, coarse, bouldery-gravel with a clay and sand matrix. Clay, silt, and sand lenses as well as varying amounts of caliche are also present.

In addition to the pediment-forming alluvial deposits, younger Quaternary units consisting of colluvium, landslide alluvium, and valley fill alluvium mantle the hillslopes and valley bottoms below the pediment surface. Colluvial deposits are derived from Arapahoe and Laramie Formations and older alluvial deposits. These units consist of 3 to 16 feet of sheetwash, soil creep, and landslide materials. These deposits locally flank the

Rocky Flats Alluvium, and generally extend to lower parts of the slopes along the principal drainages.

Landslide deposits more commonly flank the Rocky Flats Alluvium. The deposits are often bounded by headwall scarps and lobate toes at the downslope margins. Seeps issuing from the base of the Rocky Flats Alluvium contribute to landslide colluvium generation. The landslide units include earth flows, slumps, and debris flows in a thickness estimated between 10 to 33 feet.

The Arapahoe Formation is composed of claystones and silty claystones with some lenticular sandstone, and is generally less than 25 feet thick at the Site. The basal Arapahoe Sandstone is of concern as a potential contamination pathway, especially where it subcrops beneath the alluvial/bedrock unconformity.

The Laramie Formation is about 600 to 800 feet thick, and is composed of a lower sandstone/claystone/coal interval and an upper, thicker claystone interval. The permeable lower sandstones and coals of the Laramie, combined with the permeable sandstones of the Fox Hills, constitute a regional aquifer system known as the Laramie-Fox Hills aquifer. This aquifer system is an important water source in the South Platte River Basin, and is the sole water supply for some residents in the surrounding area. The Fox Hills Formation is primarily a fine-grained sandstone that is about 75 to 125 feet thick with thin siltstone and claystone interbeds. The Fox Hills Formation outcrops and subcrops along a narrow, north-south trending pattern in the extreme western part of the Site. The Pierre Formation is a 7,500-foot thick, dark gray, silty bentonitic shale that acts as a lower confining layer for the Laramie-Fox Hills aquifer in the Denver Basin. This thick marine shale unit subcrops only in the extreme western part of the Site.

2.5 Soils

Soils in the western and eastern portions of the Site are distinctly different. Most soils are alluvial (stream-deposited), colluvial (gravity-deposited), or exposed bedrock material. Soil textures are predominantly loamy, with varying amounts of clay, sand, gravel, and cobbles.

The prevalent soil types on the western side of the Site are Flatirons (very cobbly to very stony sandy loams), and Nederland (very cobbly, very sandy loam). Flatirons soils exhibit low permeability, slow runoff, and slight erosion characteristics. Nederland soils are moderately permeable, and exhibit rapid runoff and severe water erosion (on steep slopes) characteristics.

Soils on the eastern side of the Site include Denver-Kutch-Midway clay loams that exhibit low permeability, rapid runoff, and low to moderate wind erosion and severe water erosion characteristics, Valmont clay loam that exhibits low permeability, slow runoff, and moderate wind erosion and low water erosion characteristics, Haverson loam that has moderately slow permeability, slow runoff, moderate wind erosion and slight

water erosion characteristics, and Nunn clay loam that has low permeability, slow to medium runoff, slight to moderate wind erosion and slight to moderate water erosion characteristics.

2.6 Ecological Resources

2.6.1 Vegetation

The uniqueness and diversity of the plant communities at Site has been documented by a number of studies (K-H 1997a, 1997b, 1998a, 1999a, 2000a, 2001a, 2002a). The topography and close proximity of the Site to the mountains has resulted in an interesting mixture of prairie and foothills plant communities at the Site. Currently 600 species of plants are reported for the Site. No threatened or endangered plant species are known to occur at the Site. Plant communities at the Site range from xeric (dry) grassland communities to more hydric (wet) communities such as wet meadows and marshes (Figure 3).

The plant communities of greatest ecological significance on Site are the xeric tallgrass prairie, the Great Plains riparian community, the tall upland shrubland community, and wetlands. The xeric tallgrass prairie occurs on the cobbly alluvium found on pediments (flat upland areas) and ridges at the Site. This prairie is distinguished by such tallgrass plant species as big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), prairie dropseed (*Sporobolus heterolepis*), and switchgrass (*Panicum virgatum*). These species are common and abundant in the tallgrass prairies hundreds of miles to the east of the Front Range, but their presence here is rare. Big bluestem and little bluestem are the most abundant of these prairie species found at the Site with the others occurring less commonly. In addition, common montane or foothills species such as mountain muhly (*Muhlenbergia montana*), Fendler's sandwort (*Arenaria fendleri*), and Porter's aster (*Aster porteri*), also occur in the tallgrass prairie at the Site. These latter species are indicative of the unique mixing of mountain and prairie species found at the Site. The xeric tallgrass prairie was once a more common grassland along the Front Range, extending in a narrow band along the mountain front from Colorado Springs to the Wyoming border. As with many of the ecosystems along the Front Range, development, mining, overgrazing, and other human activities have destroyed the xeric tallgrass prairie. The Colorado Natural Heritage Program (CNHP) lists the xeric tallgrass prairie at the Site as the largest known remnant in Colorado and possibly North America. Because of this rarity, the CNHP has classified this plant community as very rare and susceptible to becoming endangered. The presence of breeding populations of the grasshopper sparrow, itself only known to occur in just over 100 locations in Colorado, and the presence of the State rare butterfly, the argos skipper, in the xeric tallgrass prairie on Site, are further indicators of the quality and special nature of the prairie at the Site.

The Great Plains riparian community, mapped at the Site as riparian (stream channel) woodland and shrubland, is found along streams at the Site. Examples of this community are found in the Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch drainages. Plains cottonwood (*Populus deltoides*), coyote willow (*Salix exigua*), and peach leaf

willow (*Salix amygdaloides*) predominate in this community. Another unusual shrub community, dominated by leadplant (*Amorpha fruiticosa*), is also often found in association with the Great Plains riparian community at the Site. Often found in association with the riparian community is the short upland shrubland which is dominated by snowberry (*Symphoricarpos occidentalis*) and Arkansas rose (*Rosa arkansana*). These communities provide important habitat for many of the bird and mammal species found here, including the Preble's meadow jumping mouse.

The tall upland shrubland community is found on north-facing slopes primarily in the Rock Creek drainage. This community commonly occurs just above wetlands and seeps. The dominant tall shrubs are choke cherry (*Prunus virginiana*), hawthorn (*Crataegus erythropoda*), and American plum (*Prunus americana*). Other common species in the tall upland shrubland are typical of the foothills to the west of the Site. It has been identified by the CNHP as a potentially unique shrubland community, possibly not occurring anywhere else. This community is used by many animals throughout the year for cover and is used during the spring by mule deer as fawning areas. Several rare bird species also inhabit this community during the breeding season.

The mesic mixed grassland is a mixed grass prairie community common on the hillsides at the Site. This community covers the largest amount of area at the Site and is dominated by western wheatgrass (*Agropyron smithii*) and blue grama grass (*Bouteloua gracilis*), with green needle grass (*Stipa viridula*), purple three-awn (*Aristida purpurea* ssp. *robusta*), and buffalo grass (*Buchloe dactyloides*) occurring commonly.

The U.S. Army Corps of Engineers (USCOE) delineated 1,097 separate wetlands at the Site in 1994 (USCOE, 1994). These areas occupy about 190 acres along the three drainage basins within the Site. The wetlands can be segregated into stream bottom wetlands and slope wetlands.

Stream bottom wetlands (palustrine wetlands associated with stream channels) are the most common type of wetland at the Site. Stream bottom wetlands account for 73% of the total number of wetlands and 65% of the total wetlands area. Stream bottom wetlands at the Site include *Forested wetlands, Scrub-shrub wetlands,* and *Herbaceous emergent wetlands.*

Slope area wetlands are found where ground water is discharged along hillsides between the alluvial cap and the underlying consolidated material. Although the seeps are fed by shallow aquifers, the discharge is sufficiently persistent to support well-developed stands of wetland vegetation. Slope area wetlands include *saturated, seasonal and temporary wetlands*. Saturated wetlands are located at the point of discharge of a seep and are characterized by persistent soil saturation and a short marsh vegetation type. Seasonal wetlands that are typically located farther from the water source than saturated wetlands and are consistently saturated only during periods of high discharge and are characterized by a wet meadow vegetation type. Temporary wetlands are located at the perimeter of

saturated or seasonal wetlands and are characterized by a wet meadow community type or a mesic mixed grassland type.

Stream bottom wetlands include 800 locations covering 123 acres. The Rock Creek drainage basin includes 161 wetlands covering 25 acres, the Woman Creek drainage basin includes 339 wetlands covering 58 acres, and the Walnut Creek drainage basin includes 300 wetlands covering 40 acres.

Slope area wetlands include 297 locations covering 67 acres. The Rock Creek drainage basin includes 152 wetlands covering 32 acres, the Woman Creek drainage basin includes 102 wetlands covering 27 acres, and the Walnut Creek drainage basin includes 43 wetlands covering 8 acres.

2.6.2 Wildlife

A considerable diversity of wildlife occurs at the Site. A brief discussion follows of the various groups of wildlife found at the Site.

Birds occur in all available habitats at the Site. The most common raptors at the Site year-round are red-tailed hawks, American kestrels, great horned owls, and northern harriers. In summer, the most common additional species are Swainson's hawks, golden eagles, and turkey vultures. Other species that occasionally visit the Site include the bald eagle, peregrine falcon, ferruginous hawk, and burrowing owl. Among more than 45 species of waterfowl and shorebirds at the Site, mallards, Canada geese, and great blue herons are the most common. Other frequently observed waterfowl species include buffleheads, blue-winged teal, green-winged teal, common and hooded mergansers, ring-necked ducks, redheads, and lesser scaups. Several waterfowl and shorebirds breed at the Site. Over 95 neo-tropical migrant species have been recorded at the Site, several of which have been confirmed as breeding in a variety of habitats. Common neo-tropical migrant species observed at the Site include the Say's phoebe, eastern and western kingbirds, cliff and barn swallows, American robins, yellow warblers, common yellowthroat, grasshopper sparrows, vesper sparrows, red-winged blackbirds, and western meadowlarks.

Mule deer are common across the Site with an occasional white-tailed deer mixed in the population. Deer population numbers range between 100 and 160 on an annual basis at the Site. In recent years, elk and black bear have been observed occasionally in the BZ at the Site. The most commonly observed carnivore is the coyote. Several active coyote dens are present at the Site each year. Mid to small sized animals include desert cottontails, white-tailed and black-tailed jackrabbits, raccoons, muskrats, and black-tailed prairie dogs.

Amphibians and reptiles can be observed across the Site in the appropriate habitats for each species. Common species include the prairie rattlesnake, boreal chorus frogs, northern leopard frogs, western painted turtles, and bullfrogs. Occasionally the eastern

short-horned lizard can be observed on the xeric tallgrass prairie. Fish can be found in the intermittent streams and most ponds at the Site. Common species include fathead minnows, creek chubs, and an occasional small-mouth and large-mouth bass.

2.7 Species Considered In This Assessment

Based on a species list received from the USFWS the following species have been evaluated as part of this PBA. Species descriptions are presented in Part I, Appendix B.

Animals	**Legal Status**
American burying beetle (*Nicrophorus americanus*)*	LE
Bald eagle (*Haliaeetus leucocephalus*)	LT
Black-footed ferret (*Mustela nigripes*)	LE
Black-tailed prairie dog (*Cynomys ludovicianus*)	C
Boreal toad (*Bufo boreas boreas*)	C
Canada lynx (*Lynx canadensis*)	LT
Eskimo curlew (*Numenius borealis*)*	LE
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	LT
Least tern (*Sterna antillarum*)*	LE
Mexican spotted owl (*Strix occidentalis lucida*)	LT
Mountain plover (*Charadrius montanus*)	PT
Pallid sturgeon (*Scaphirhynchus albus*)*	LT
Pawnee montane skipper (*Hesperia leonardus montana*)	LT
Piping plover (*Charadrius melodus*)*	LT
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	LT
Whooping crane (*Grus americana*)*	LE
Plants	
Colorado butterfly plant (*Gaura neomexicana coloradensis*)	LT
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	LT
Western prairie fringed orchid (*Platanthera praeclara*)*	LT

* = Lower Platte River species
C = Candidate for listing
LT = Listed threatened
LE = Listed endangered
PT = Proposed threatened

3. No Effect Activities

This section of Part I of the PBA outlines various Site activities that will have no effect on listed species or their habitat. Additional or unforeseen future projects that are not listed in this section will be evaluated based on the following criteria to determine whether they meet the "no effect" definition. If projects meet the "no effect" criteria then no further consultation with the USFWS will be pursued. If projects do not meet the "no effect" criteria, then further evaluation will be conducted to determine whether they meet the "may affect, but not likely to adversely affect" or "adverse effect" criteria. Evaluations will include an assessment of potential direct and indirect effects, interdependent actions, cumulative effects (effects from state and private party actions), and interrelated actions. Projects described in this section, along with any indirect effects, interdependent actions, and interrelated actions, were deemed to have no effect on any listed species, specifically the Preble's mouse, for the following reasons (the flowchart in Figure 4 summarizes the following criteria and allows for easier determination of project activity effects):

- The majority of these activities are not located within the current Preble's protection area (see Section 1.2 of Part I of the PBA for the definition of the current Preble's protection areas; [Figure 5; map in Appendix A of Part I of PBA]).
- Only temporary disturbance to the Preble's habitat will result from these activities (such as trampling of vegetation). No permanent loss of habitat will occur.
- Vegetation will not be removed or damaged during these activities within the current Preble's protection areas.
- Soil disturbance is very minimal (< 0.5 sq. ft. per action) in the current Preble's protection areas.
- For projects located within the current Preble's protection areas, activities will be conducted on foot or using established roads and two-tracks.
- No heavy equipment (i.e., front end loaders, track hoes, back hoes, etc.) are necessary to conduct the activities when in the current Preble's protection area.
- The majority of the projects listed in this section of the PBA are scattered throughout the BZ and are not concentrated or contiguous at a given location. Therefore the potential for impacts are minimal because suitable habitat exists adjacent to project areas.
- Due to the fact that most of the activities listed in this section do not take place in or directly adjacent to Preble's habitat, and that the activities that may take place in Preble's habitat are very low impact (see reasons above), no cumulative, additive, direct or indirect effects, interdependent actions, or interrelated actions are expected to occur. Examples of these types of impacts to evaluate might include sedimentation and erosion potential, changes in water flows, or noise concerns. See further discussion of this issue in the Analysis of Impacts section of Part I of the PBA.

To minimize impacts to the Preble's mouse, project management will utilize and maintain the following best management practices (BMPs) except where regulatory and/or health and safety requirements take precedence:

- Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of high habitat value[1]. For example, large willow patches should be avoided.
- Reduce the impact footprint (i.e., no excessive walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
- Conduct all activities during daylight hours, when the Preble's mouse is less active when scheduling during the hibernation season of the mouse cannot be accomplished.
- Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, not reentering area once work is completed).
- Use established roads (i.e. paved, gravel, two-track, historically used routes to monitoring locations) for vehicle traffic.
- Remove trash and unnecessary equipment in project areas after work is completed.
- Revegetate disturbed Preble's habitat with native species after the activity has been completed in accordance with the Habitat Mitigation Techniques Plan (Appendix A, Part II of PBA).
- Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat.
- Minimize project activities in wet areas and conditions to avoid damage to the habitat.
- The projects contained in this section of the PBA are not expected to result in erosion or sedimentation problems with perhaps the exception of the building and structure decommissioning and demolition in the IA and IA revegetation (areas outside of Preble's habitat). The building decommissioning and demolition in the IA and the IA revegetation activities will use appropriate erosion and sediment control BMPs.
- Inspect and clean equipment of weeds/seed to prevent spread of noxious weeds.

Project managers will receive a copy of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. Project management is responsible to ensure compliance with the requirements and guidelines outlined in the PBA and BO. Projects are responsible to follow and maintain the best management practices (BMPs).

The following table lists the activities included in the "no effect" section of the PBA. The table summarizes the potential project impacts within the current Preble's protection

[1] For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 Site vegetation map. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, structures are not considered habitat for the Preble's mouse.

areas. Additional detail on each project is found following the table. Figures 6 and 7 show the locations of some of these projects. Project evaluations are based on worst case scenarios, except where specific plans or information currently exists. The activities included in this section are being consulted on because they are likely to happen. Their inclusion here, however, does not constitute the fact that they will indeed occur. Human impacts are defined as human foot traffic in an area. Vegetation/soil impacts are defined as activities that in some way disturb vegetation or soil beyond that associated with foot traffic in an area.

	Preble's Mouse Habitat Potential Impacts	
Project	**Human Impacts***	**Vegetation/Soil Impacts***
Groundwater Monitoring	Foot traffic, quarterly, approximately 45 wells, 1 to 2 hours per well.	None
Soil Sampling	Foot traffic, ½ hour per location	Typically <12 per year, <0.5 sq ft per sample
Surface Water Monitoring	Foot traffic, 12 locations, 3X/Month.	None
Building 124: Water Treatment Plant	None	None
Building 891: Combined Water Treatment Facility Operations	None	None
Sanitary Waste Water Operations	None	None
Sanitary Waste Disposal	None	None
Routine Administrative And Infrastructure Support Activities	None	None
Utilities	None	None
Waste Storage And Removal	None	None
Building And Structure Decommissioning And Demolition in IA	None	None
The Present Landfill	None	None
Recycling Of Concrete From Building Rubble	None	None
IA Revegetation Activities	None	None
Routine Soil Remediation	None	None

* Impacts are estimated and are not exact numbers.

3.1 Routine Activities

This section describes ongoing routine activities that take place at the Site that have no effect on the species under evaluation in this PBA. The majority of these activities have

been ongoing for more than a decade, and many have been ongoing since the Site was first activated more than 50 years ago.

3.1.1 Monitoring and Routine Maintenance

3.1.1.1 Groundwater Monitoring

The Groundwater Monitoring Program (GMP) consists of groundwater monitoring, compliance reporting, evaluation of groundwater exceedances of Rocky Flats Cleanup Agreement (RFCA) Action Levels, and maintenance of the Site monitoring well network. Monitoring includes groundwater sample collection, water level measurements, sample and data management, and well development and abandonment. The well development and well abandonment and removal program components of the groundwater program are addressed later in Part I of the PBA under the section dealing with "May Affect, But Unlikely To Adversely Affect" activities.

The groundwater monitoring network includes wells that are sampled for water quality and water levels. The monitoring program consists of water quality sample collection, well development, water level measurements, field parameter measurements, sample management, and data management done on a quarterly basis. At times, the program may cover special sampling, well development and water level measurements, aquifer testing, and special reporting. These latter activities, if conducted, would require an additional visit to a well occasionally and the addition of some small monitoring equipment that would be attached to the well head. The monitoring wells are scattered throughout the BZ and approximately 45 are found within the current Preble's protection areas. These activities would not disturb habitat, other than the drive to the well, which occurs along preexisting roads [i.e., two track roads, historical routes to the monitoring wells]. Piezometer wells in Preble's mouse habitat are accessed on foot, and the activity at the well is limited to taking a water level measurement. At the larger wells, samples are collected, requiring longer stays (about one to two hours) at the location. These short-duration visits (a few hours per visit) are conducted once every three months, and even where adjacent to or within Preble's mouse habitat, are nonintrusive activities. Established roads will be used for all vehicle traffic, activities will be performed during daylight hours, and no vegetation will be cut. Therefore, activities under this project will have no effect on the Preble's mouse. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

3.1.1.2 Soil Sampling

Soil sampling is conducted frequently at the Site to characterize an area for potential contaminants. Most of this sampling takes place in disturbed areas where the potential for contaminants exists. In Preble's habitat, off-road sampling would be conducted on foot. Samples are typically taken with hand tools and consist of scraping the top inch or two of soil from a small area, generally less than one square foot. Hundreds of samples are taken each year across the Site with less than a dozen or so typically occurring in current Preble's protection area. Soil sampling has been conducted across the Site for the

past 50 years with no apparent effects to the Preble's mouse, Preble's habitat or other listed species under consideration. Trapping data from each of the drainages show mice continue to be captured where they have been trapped before. Telemetry data from the Site have shown the mice continue to move up and down the stream drainages with no apparent impacts. Habitat characterization data shows no effects to the vegetation resulting from any soil sampling efforts (DOE 1996, K-H 1998b, 1999b, 2000b, 2001b, 2002b). Thus no effect to the Preble's mouse is expected from this activity. Subsurface soil sampling is discussed in section 4.2.8 of Part I of the PBA.

3.1.1.3 Surface Water Monitoring

Routine activities include sampling and tracking; analytical data screening and quality determinations; and preparation, implementation, and maintenance of management controls (e.g., procedures, plans, schedules). Surface water sampling includes monthly monitoring of surface water effluent from the Site's Waste Water Treatment Plant (WWTP; one composite sample for one week per month) and predischarge sampling and analysis to ensure that Site surface water discharges meet water quality standards. Predischarge sampling consists of collecting grab samples from ponds that will be discharged, prior to the discharge, approximately every two months, or as pond levels dictate. Ponds are accessed via routinely maintained, improved gravel roads.

Other monitoring includes operation of an automated monitoring network for water sample collection; installation, testing, and operation of water quality probes; and flow monitoring at surface water sampling locations. Flow data are monitored continuously via radio telemetry and reported per the regulatory requirements of the National Pollutant Discharge Elimination System (NPDES) Permit and RFCA.

Monitoring stations measure water flow and sample surface water for water quality. The stations are visited two to three times weekly, depending on flow conditions. During high-runoff periods, the stations may be visited daily. The sample stations are accessible by existing roads, and vehicular travel is restricted to these roads. Some sample locations are located in Preble's mouse habitat, but the sampling activity is nonintrusive, consisting of a technician driving to the sample location, walking from the road to the sampler, checking equipment, exchanging full sample bottles for empty ones, and departing from the location. This activity is done during the daytime when Preble's mice are normally less active. Water samples consist of five-gallon samples collected over several days, weeks, or months. Collection of such a small volume of water produces a negligible effect on downstream flow.

Additional monitoring is done around buildings that are undergoing or scheduled for decommissioning. Small monitoring installations may be placed as close as possible to the building or building cluster prior to the start of demolition. These installations take advantage of existing drainage ditches, culverts, or other stormwater runways in areas adjacent to the buildings. The USFWS concurred with this surface water monitoring in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

Installation of temporary surface water monitoring flumes is addressed later in Part I of the PBA under the section dealing with activities that may affect, but are unlikely to adversely affect the Preble's mouse.

3.1.2 Building 124: Water Treatment Plant

The Water Treatment Plant processes raw water to provide potable water to all Site facilities. The Water Treatment Plant treats an average of 300,000 gallons of raw water per day for human consumption, fire protection, and other uses. This water is purchased from the Denver Water Board, and does not come from Site surface waters. Decommissioning and demolition (D&D) of the water treatment plant will have no effect on any listed species because the plant buildings are located in the IA. Water depletion issues will be discussed in Part II of this PBA.

3.1.3 Building 891: Combined Water Treatment Facility Operations

This activity includes the Building 891 daily operations and maintenance, including sampling, operations, transportation, reporting, and water collection/transfer in support of the treatment facility and environmental restoration projects. At present, Building 891 processes and treats various Site waters. These waters are discharged into the South Interceptor Ditch after treatment. Building 891 will continue to operate in accordance with the agency agreements, with the primary goal of treating liquid wastes. Generally, wastes treated include decontamination water and incidental water from environmental restoration projects. Because this activity transfers, but does not deplete waters within the IA, no effect to listed species onsite or off-Site is expected. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

D&D of Building 891 will not affect the Preble's mouse because it is not in current Preble's protection areas.

3.1.4 Sanitary Waste Water Operations

3.1.4.1 Disposition Of Incidental Waters

This activity involves coordinating the sampling and disposition of about 130 incidental waters that accumulates (e.g. water that accumulates in utility pits, valve vaults, secondary containment, and excavation pits) per year. Site Procedure 1-C91-EPR-SW.01 addresses the control and disposition of incidental water at the Site. A determination is made as to whether the water is to be discharged to the ground as clean surface water, sent to the WWTP, or transferred to another Site treatment facility. This activity is necessary to prevent water discharges that could result in non-compliance with RFCA surface water standards. Because this activity transfers but does not deplete waters within the industrialized area, no effect to listed species onsite or off-Site is expected. The

USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

3.1.4.2 Disposition Of Internal Waste Water Streams

This activity involves the evaluation and disposition of routine and non-routine waste streams. A determination is made as to whether the water is discharged to the WWTP or transferred to another Site treatment facility. This activity is necessary to prevent discharges that could disrupt microbial treatment processes at the WWTP, with resultant potential NPDES permit violations and penalties. Because this activity transfers, but does not deplete waters within the industrialized area, no effect to listed species onsite or off-Site is expected. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

3.1.5 Sanitary Waste Disposal

3.1.5.1 Routine Sanitary Waste Disposal

The Sanitary Waste Project includes day-to-day collection, transportation, and disposal of non-hazardous, non-radioactive sanitary waste. Waste from routine operations and from decommissioning and demolition activities is collected in dumpsters and rolloff containers. This waste is transported off-Site and placed in an off-Site commercial (Subtitle D) landfill. This activity has no effect on listed species. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

3.1.6 Routine Administrative And Infrastructure Support Activities

Normal administrative activities will continue in buildings and facilities within the industrialized area as Site closure proceeds. These activities may require continuation of infrastructure support activities such as operation of the nitrogen plant, as well as logistical support, receiving and shipping, ambulance service, traffic management, excess property disposition, facility management, and security force operations. Consultation regarding these routine administrative and infrastructure support activities does not include issues related to water depletion related to these activities. Water use and depletions from these routine activities will be discussed in Part II of the PBA. Otherwise, because these activities are conducted within the industrialized area where no habitat for listed species exists, there will be no effect on listed species from continuation of these activities.

3.1.7 Utilities

As facilities are deactivated and closed, the need for utility services and systems will diminish. Deactivation of utility systems includes:

- Site water treatment plant: Once closed, bottled, potable water will be supplied to all remaining operational buildings or potentially by individual, portable water purification units.
- Site nitrogen plant: It will be shut down when special nuclear material needs no longer require the nitrogen.
- The steam plant boilers: The steam plant boilers have already been shut down and the Site is operating on portable skid boilers.
- The natural gas distribution system: It will be shut down as areas and facilities are closed.
- The Site electrical power distribution system: It will continue in operation through closure to support both deactivation and operational activities, but the number of substations will be reduced to one as soon as operational requirements will allow. Eventually at Site closure it will be reduced to zero.
- Waste water treatment plant: See section 3.2 of Part I of the PBA.

Upon decommissioning, subsurface utilities that are three feet or deeper below ground level may be abandoned (capped, grouted) and left in place. Deactivated underground utilities will be abandoned in place unless excavation is required to facilitate environmental remediation. The end state for utilities projects will occur at the point in time when there is no longer demand by the Site for these utility services, or at such time that the DOE relinquishes responsibility for the Site or for providing utility services. In the interim, these utilities will remain in place and active. Because these activities are located in the IA, no effect is expected to listed species. Power line removals are discussed in another section below. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

3.1.8 Waste Storage And Removal

Waste storage is a routine activity at the Site that is conducted within buildings and specific storage facilities located within the IA. The waste storage activities take place in areas well removed from Preble's mouse habitat and watercourses at the Site. The present operation and eventual decommissioning of these storage facilities is expected to have no effect on the Preble's mouse or other listed species, because none of these activities will occur within or adjacent to habitat of any listed species. The waste storage and removal activities were previously concurred with by the USFWS in a earlier draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

3.2 Building And Structure Decommissioning And Demolition

Building and structure D&D includes the tasks of characterization, site preparation, decontamination, dismantlement, demolition, and project management and support

services. After buildings or structures are removed, revegetation will be conducted using native plant species. These facilities are not located in current Preble's protection areas. Therefore, these D&D activities will not affect the Preble's mouse or other listed species. Water depletion issues associated with removal of these structures will be dealt with in Part II of the PBA. The following table lists the facility clusters and structure numbers along with a short general description, where applicable. The table is not intended to be an exhaustive list of every building/structure number on Site, however, none of these buildings are in Preble's habitat. Any buildings or structures found within Preble's habitat are discussed elsewhere in the PBA. Otherwise, any unlisted buildings or structures are found outside Preble's habitat. This description summarizes several sections that the USFWS had previously concurred with in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C). The table lists the section numbers from the earlier draft PBA where a more extensive description of each facility cluster can be found. Potential indirect effects to the Preble's mouse may include increased noise, dust, erosion, or sedimentation problems. These project activities are not expected to create any erosion or sedimentation problems in the current Preble's protection areas. Best management practices will be used to suppress dust (water spray), and control erosion or sedimentation problems that could reach the Preble's mouse habitat. Excavation and post-project grading will be minimized to the extent needed to accomplish the remediation and cleanup objectives. Disturbances will be revegetated following protocols outlined in Part II of the PBA.

Facility Cluster	Section in Draft PBA	Buildings/structures to be removed
111 Facility Cluster	6.1	111, T111A, T112A, T112B, T112C, T115A, T115B, T115C, 116, T117A, T119A, T119B, T121A, unnumbered guard post, bus stop/car pool shelter. General staff administration buildings and offices.
130 Cluster	3.3	Buildings 130, 131, 132, C130, and temporary buildings T130A through T130J. Administrative offices and warehouse.
SECBZO Facility Cluster	3.1	Buildings 120, T120A, and 920, and their associated underground storage tanks—Tanks 043, 243, 247, 287, 318, and 319, as well as the aboveground replacements for Tanks 243 and 287, TK-32A and TK-1A.
INFMET Cluster	3.2	Building 180. This is the meteorological tower in the NW BZ.
903/905 Cluster	5.1	Buildings 903A, 903B, and 966,
891/900 Groundwater Treatment Cluster	5.2	Buildings 891, 900A, 900B, 900C, 900D, and 900E, and Tanks 891-T-200, T-201, T-202, T-203, T-204, T-205, T-206, and T-207.
125/441 Cluster	6.2	125, 126, 441, tanks 079 and 278. Laboratory, source storage, office buildings, liquid nitrogen storage tanks
444 Cluster	6.3	444, 427, 427A, 445, 447, 448, 449, 450, 451, 453, 454, 455, 457, T444A, and Tank 427
690T Cluster	6.4	662, storage sheds, and Tanks 036 and 037
910 Cluster	6.5	215D, 226, 227, 228A, 228B, and 910, and 3 separate tanks (B226 EDTA Tank, B227 Nitric Acid Tank, and B215D Evaporator Distillate Storage Tank)
559 Cluster	6.6	559, 560, 561, 562, 563, and 564, six tanks
707 Cluster	6.7	707, 708, 711, 711A, and 718, Tanks 206, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 284, 223, 290, 324, 325, and TK-16
750 Cluster	6.8	750, 705, 706, T706A, 707S, T707B, 709, 709A, T750A, T750B, T750C, T750D, and 763 S750, and tank 205
750 Pad Cluster	6.9	Tents 2, 3, 4, 5, 6, and 12, Buildings T750E and T750F, and one tank
750HAZ Cluster	6.10	old 551 RCRA Pad, S374, three hazardous waste storage pads
569 Cluster	6.11	569 and 570

886 Cluster	6.12	875, 886, 880, 886, T886A, 886, 888A, 888, and 828
371/374 Cluster	6.13	371, 374, 373, 374A, 377, 378, 381, T371H, T371J, T371K, 376, T376A, T371I, and 371A, and tanks 163, 164, 165, 166, 167, 168, 169, 170, 171, 224, 225, 226, 227, and 228
778 Cluster	6.14	778
779 Cluster	6.15	779, 729, 782, 727, 780, 783, 780A, and 780B; cooling towers 784, 785, 786, and 787; and tanks TK-18, TK-19, and TK-24.
771/744 Cluster	6.16	771, 774, 714, 714A, 714B, 715, 715A, 716, 717, 771C, 772, 772A, 774A, 774B, 775, 790, 770, 771B, T771A, T771B, T771C, T771D, T771E, T771F, T771G, T771H, T771J, T771K, and T771L, and tanks 173, 174, 175, 176, 179, 180, 182, 183, 184, 185, 192, 193, 194, 195, 292, and 293.
776/777 Cluster	6.17	776, 777, 701, 702, 703, 712, 712A, 713, 713A, and 781, and Tanks 199, 200, 201, 202, 203, 207, 244, and 245
881 Facility Cluster	6.18	Buildings 881, 881CT, 881F, 881G, and 881H; the 881–883 Stacks; the 881–883 Tunnel; and Tanks 002, 013, 014, 015, 016, 029, and TK-66
The 865/883 Cluster	6.19	Buildings 827, 863, 865, 865, 867, 868, 879, 883, 889, and 883CT; the Carpenter Shop; and Tanks 010, 011, 012, 024, 026, 252, 323, and TK-25A
The 991 Cluster	6.20	991, 996, 997, 998, 999, 984, 985, and 989, and five tanks
566, 800A, and SECNPZ Clusters	6.21	566, 566A, and 566B, and Tank 132, 830, T881A, T881B, T883A, T883B, T883C, T883D, 884, and 885, and the 889 Slab and 890 cooling tower, 213, 260, 372, 372A, 375, 519, 550, 557, 761, 762, 762A, 764, 765, 765A, 773, 792, 792A, 888, 901, and 992, and Tanks 153, 153, 154, 155, 162, 230, and 235.
The INFSEW Cluster	7.1	972, 973, 974, 974A, and 988 Buildings and tanks required for sanitary sewage treatment.
The 440 Cluster	7.2	439, T439A, T439D, 440, and T447A
The 664 Cluster	7.3	664, 666, 668, and T664
The 551 Cluster	7.4	551 and T551A
The 904/906 Cluster	7.5	T760A, T760B, T904A, and 906; the 904 Pad, the P904 propane tank farm; and pondcrete storage tents 7, 8, 9, 10, and 11
The Process Waste Transfer System (PWTS) Cluster	7.6	207, 528, 728, 730, 731, 732, 828, 867 and 887; 10 valve vaults; and 7 separate tanks.

The 980 Cluster	7.7	965, 968, and 980
The 207 Cluster	7.8	308A, 788, and T788A, and a clarifier tank. B788, T788A, and B308A, Tanks 023 (propane storage, west of Building 788), 136 (cement silo southwest of Building 788), 137 (cement silo west of Building 788), 138 (sludge thickener tank, also known as the 207 Clarifier, east of Building 788), and 139 (propane storage, west of Building 788). Cementation Process Building Cluster, Solar Ponds Pump House
The 964 Cluster	7.9	964 and associated storage buildings

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3.3 Specific Projects

3.3.1 The Present Landfill

Use of the Present landfill (a portion of Operable Unit 7, OU7) was discontinued in 1998. To provide soil stabilization until final closure, the landfill surface was regraded and revegetated. Maintenance may include visual inspections, repair of settlement and erosion damage, weed control, and reseeding. Required groundwater and surface water monitoring will also be conducted on associated wells. Current closure plans for the landfill entail further covering the landfill with a cobble cover or about two feet of soil and revegetating the area. Operation and maintenance of the existing OU7 seep water treatment installation consists of daily inspections, sample collection and analysis, quarterly reporting, and maintenance. The East Landfill Pond on the east end of the Present landfill will remain in place after closure. Some modification of the East Landfill Pond dam may be conducted, but the work will all be outside Preble's habitat.

Neither the Present landfill nor the East Landfill Pond are located in current Preble's protection areas. The actual physical work conducted to provide final remediation to the Present landfill will therefore have no effect on the Preble's mouse. Although some noise and potential dust from the work on the Present landfill are to be expected, no effect to the Preble's mouse is expected since Preble's mice have never been captured near the Present landfill. In 1996, trapping was conducted at the East Landfill Pond to determine whether Preble's mice occurred there (K-H 1996). Trapping was conducted in the marginal habitat near the inlet of the East Landfill Pond. Trapping was conducted for a total of 480 trapnights over 4 days from August 13-16, 1996 and no Preble's mice were captured at the pond. Additionally, telemetry data collected in the Walnut Creek drainage during 1999 showed no individuals moving in the side drainage where the East Landfill Pond is located. Potential sedimentation and erosion problems from the Present landfill project will be controlled through the use of silt fence and the fact that the East Landfill Pond would capture any sediment that might runoff from the landfill area. Therefore, the project will have no effect on the Preble's mouse.

3.3.2 Recycling Of Concrete From Building Rubble

During the demolition phase of the building decommissioning discussed above, a large volume (about 130,000 cubic yards) of concrete rubble will be generated. Concrete rubble that meets free-release criteria can be used as backfill onsite. Concrete that is found to be below the unrestricted release limits for radionuclides, and is considered to be non-hazardous, non-beryllium contaminated, and non-Toxic Substances Control Act (TSCA) regulated, can be free-released.

The rubble will be stockpiled at locations in the heavily industrialized areas of the IA where buildings or parking lots were once present. These stockpiles may cover several acres and will have dust suppression and surface water runoff controls in place to protect air and surface water quality. Soil stabilizers will be used to control suspension of dust and fine materials, and silt fencing and berms will be used to control sediment transport

and erosion. Concrete rubble may be processed into backfill material using a crusher. During crushing, a water mist may be used to control fugitive dust. Similar methods or covers may be used when rubble or recycled material is being transported.

No effect on the Preble's mouse is expected from this activity since it will occur in the IA outside of current Preble's protection area. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000). The concurrence letter is included in Part I, Appendix C.

3.3.3 IA Revegetation Activities

As buildings and structures are removed within the IA, areas will be graded and revegetated with native plant species following the IA Regrading Plan (K-H 2003a) and IA Revegetation Plan (K-H 2003b). These areas are currently upland areas of low quality (i.e. parking lots, previously disturbed areas, buildings) that are located largely outside of Preble's habitat. The portions of the IA located within current Preble's protection areas that will be removed and returned to a native state are discussed in the "may affect, but not likely to adversely affect" section of Part I of the PBA. As these areas of currently low quality value are revegetated with native species, this will create additional native upland areas that may be used by wildlife, including the Preble's mouse. The total acreage of the IA to be returned to a native state is approximately 250 to 300 acres.

Because the activities discussed in this section are outside the current Preble's protection areas, there are no direct effects to the Preble's mouse. Indirect effects, however, may include noise, dust, erosion, sedimentation from these activities. Best management practices, including redundant erosion control measures and monitoring of effectiveness of these controls, will be used to negate indirect effects. Therefore no effect is expected from these activities on the Preble's mouse.

3.3.4 Routine Soil Remediation

Remediation activities will take place at several locations in the IA where cleanup is necessary to meet RFCA agreement requirements. These activities generally involve either removal or appropriate disposal/storage of the soils or covering the areas with additional soil cover. Heavy equipment is used for these activities. Remediation activities will follow the RFCA Standard Operating Protocol (RSOP) for Asphalt and Soil Management (K-H 2001c, Part II, Appendix C). An example of such an activity, but not limited to this project, is the 903 Pad remediation. It is taking place outside current Preble's protection areas. For this project and any others outside Preble's habitat, no direct effect on the Preble's mouse is expected. Best management practices, including redundant erosion control measures where needed, and monitoring of effectiveness of these controls, will be used to negate indirect effects. Remediation projects within Preble's habitat are identified and discussed in other sections of the PBA.

4. Activities That May Affect Listed Species, But Are Not Likely To Adversely Affect

The activities listed in this section of the PBA are those that may affect listed threatened or endangered species, but are not likely to adversely affect them. Additional or unforeseen future projects that are not listed in this section will be evaluated based on the following criteria to determine whether they meet the "may affect, but not likely to adversely affect" definition. If projects do not meet the "no effect" or "may affect, but not likely to adversely affect" criteria then they automatically fall into the "adverse effect" category. Evaluations will include an assessment of potential direct and indirect effects, interdependent actions, cumulative effects (effects from state and private party actions), and interrelated actions. Projects described in this section, along with any indirect effects, interdependent actions, and interrelated actions, were deemed to "may affect, but not likely to adversely affect" any listed species (in particular the Preble's mouse) for the following reasons (the flowchart in Figure 4 summarizes the following criteria and allows for easier determination of project activity effects):

- Only temporary disturbance to the Preble's habitat will result from these activities (such as trampling of vegetation). No permanent loss of habitat will occur.
- Soil or vegetation disturbance will be limited to that created by pulling of fence posts or guard rail posts, installing temporary flumes, removing power lines, removing riprap piles, removing above ground pipelines, cutting of a few shrub stems to access a work area, or similar type small impacts.
- The majority of the activities are located near established roads, so minimal off-road vehicle use is required.
- The temporal impacts will be minor for these activities. Routine activities may be done monthly or less frequently and typically require only a few hours to complete. For the non-routine activities, the work required to complete the project are mostly one-time events and once completed will no longer require access to those areas in the future.
- For the routine activities, these have been conducted for years at the Site and have had no apparent detrimental effects on the Preble's mouse or other listed species. Trapping and telemetry data have been collected on the Preble's mouse in each of the drainages at the Site over the years and have demonstrated that Preble's mice continue to occur and be captured while the routine activities continue (K-H 1997c, 1998b, 1999b, 2000b, 2001b, 2002b; RMRS 1996). Additionally, specific project trapping and telemetry data have shown the Preble's mice continue to be captured in the vicinity of project areas during and after project activities have ceased (B-4 Dam Toe Slope Project: DOE 1996; East Trenches Treatment System: K-H 2000b).
- Excavation in the riparian shrub community will not occur except for WARP and power line removals, where previously concurred with by the USFWS.

- Heavy or motorized equipment will enter the riparian plant community or cross water courses only on established roads and dam tops, or as indicated in project descriptions and where previously concurred with by the USFWS.
- The types of equipment needed to accomplish these activities may include pickup trucks, bobcats, all terrain vehicles (ATV), backhoes, trackhoes, front end loaders, cranes, or rolloffs. The type of equipment used would be the minimum needed to conduct the work. Larger pieces of heavy equipment such as backhoes, trackhoes, front end loaders, dump trucks, etc. would be used for the specific projects listed below and would largely remain on roads and other previously disturbed areas.
- The majority of the projects listed in this section of the PBA are scattered throughout the BZ and are not concentrated or contiguous at a given location. Therefore the potential for impacts are minimal because suitable habitat exists adjacent to project areas.
- Most activities are related to removing structures from the BZ, thereby ultimately improving and/or creating additional wildlife habitat, including Preble's mouse habitat.

To minimize impacts to the Preble's mouse, project management will utilize and maintain the following BMPs except where regulatory and/or health and safety requirements take precedence.

- Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of high habitat value[2]. For example, large willow patches should be avoided.
- Reduce the impact footprint (i.e., no excessive walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
- Conduct all activities during daylight hours, when the Preble's mouse is less active when scheduling during the hibernation season of the mouse cannot be accomplished.
- Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, not reentering area once work is completed).
- Use established roads (i.e. paved, gravel, two-track, historically used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the safest and most direct route that minimizes impacts to the habitat.
- Limit equipment entrance/exit areas to the minimum necessary to accomplish the work.
- Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.

[2] For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 Site vegetation map. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, structures are not considered habitat for the Preble's mouse.

- No blading and grubbing of woody vegetation will occur in areas of temporary disturbance.
- Remove trash and unnecessary equipment in project areas after work is completed.
- Revegetate disturbed Preble's habitat with native species after the activity has been completed in accordance with the Habitat Mitigation Techniques Plan (Appendix A, Part II of PBA).
- Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat.
- Minimize project activities in wet areas and conditions to avoid damage to the habitat.
- Use erosion controls (i.e., silt fence, hay bales, mulching, tackifiers, surface roughening) to control erosion and sedimentation problems. Projects will monitor erosion control effectiveness and modify control techniques as needed through project completion.
- Use the least amount of and/or smallest equipment necessary to accomplish the work.
- Do not clean equipment in Preble's habitat or in areas where runoff will enter Preble's habitat.
- Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
- Inspect and clean equipment of weeds/seed to prevent spread of noxious weeds.

Project managers will receive a copy of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. Project management is responsible to ensure compliance with the requirements and guidelines outlined in the PBA and BO. Projects are responsible to follow and maintain the best management practices (BMPs).

The following table lists the activities included in the "may affect, but not likely to adversely affect" section of the PBA. The table summarizes the potential project impacts within the current Preble's protection areas. Additional detail on each project is found following the table. Figures 6 and 7 show the locations of some of these projects. Project evaluations are based on worst case scenarios, except where specific plans or information currently exists. The activities included in this section are being consulted on because they are likely to happen. Their inclusion here, however, does not constitute the fact that they will indeed occur. Human impacts are defined as human foot traffic in an area. Vegetation/soil impacts are defined as activities that in some way disturb vegetation or soil beyond that associated with foot traffic in an area.

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Project	Human impact*	Vegetation/soil impact*
Ecological Monitoring	Foot traffic, once a week, 1 to 2 hours each	None
Air Quality Monitoring	8 samplers in habitat Foot traffic 2X/month	Whack vegetation to 6-8" with hand-held whacker 5 feet around sampler (1X-2X/annually).
Routine Pond Operations	Foot traffic weekly.	Dam road grading, vegetation removal, dam mowing, riprap rearrangement.
Routine Road Maintenance, Road Repair, Grading, and Mowing	None	1Xgrading/year, roads no wider than current width 1 or 2Xmowing/year, no farther than 20' off road edge along firebreak roads in BZ
Weed And Vegetation Management	Foot traffic 3X/year. 3 hours per visit.	3 acres of weed control per year/Rock Creek. Pulling weeds, whacking weeds, spraying weeds with herbicide.
Well Abandonment And Replacement Program	Foot traffic during removal.	Approximately 100 wells. Removal of 6 inch pads and/or 4x4 foot pads. Entrance and exit by forklift.
Removal of Concrete Pads from Abandoned Wells	Foot traffic during removal.	Removal of 6 inch pads and/or 4x4 foot pads. Entrance and exit by forklift.
Subsurface Soil Sampling	Foot traffic.	Truck mounted geoprobe entrance to and exit from area.
Groundwater Treatment System Monitoring	Foot traffic.	Replacement of iron filings. Excavation of pipes, near roads.
Trash Removal From Buffer Zone	Foot traffic only. A few days a year.	None
B-4 Pond Building	Foot traffic. One time project.	No off road driving. Removal of 30 by 30 foot structure.
C-1 Pond Rip Rap Pile	None	Removal of 20 by 20 foot pile of riprap, located next to road. Using front end loader, or other heavy equipment. One time project.
Dirt Pile Along Walnut Creek Southwest Of Landfill	None	30 by 40 feet of gravel/dirt removal. Using heavy equipment to either remove pile or push back into borrow area.

Project	Human impact*	Vegetation/soil impact*
Pipeline Removal	Foot traffic for monitoring once to twice a year. Walking along pipeline for visual inspection	Heavy equipment to pull pipeline out of habitat, excavation of pipeline where it crosses the road. One time project. T-posts holding pipeline will be removed.
Fence and T-Post Removal	Foot traffic in areas not accessible by bobcat.	Bobcat like equipment used to pull t-posts and fence posts. Approximately 18,000 feet of fence line.
Gravel/Riprap Storage Area	None	Driving on roads and disturbed areas only. Heavy equipment o remove concrete and gravel. One time project.
Guard Rails Along Roads	None	Heavy equipment, one time project. Approximately 1,000 feet of guard rail.
Power Pole And Power Line Removal	Foot traffic	Driving bucket truck to and from pole. Cutting power pole and dragging pole out of habitat using a bobcat. Approximately 40 poles in habitat.
Security Force Buffer Zone Activities	None	Off road driving in emergencies.
South Interceptor Ditch Maintenance	Quarterly visual inspections of ditch. Foot traffic.	Dredging of ditch from established road running along ditch. As needed.
Temporary Surface Water Flume Projects	Foot traffic for monitoring once installed. 3X/month.	One vehicle to enter and exit area. Soil disturbance approximately 8 sq. feet
Buffer Zone Concrete Removal/Incinerator Project	N/A. Separate consultation.	N/A. Separate consultation.

* Impacts are estimated and are not exact numbers. N/A = Not applicable.

4.1 Environmental Baseline

In Jefferson County, the Preble's mouse has been captured or suitable habitat exists along portions of Coal Creek and Ralston Creek, in addition to that found in Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch at the Site. Based on the availability of potentially suitable habitat and lack of trapping information, Preble's mice are assumed to occupy appropriate habitat throughout Jefferson County.

In Boulder County, the Preble's mouse has been captured or suitable habitat exists along portions of Coal Creek, South Boulder Creek, Saint Vrain Creek, and within the City of Boulder Open Space and Mountain Parks system. Preble's habitat also exists along South Boulder Canal, Doudy Draw, and Spring Brook. Based on the availability of potentially suitable habitat and lack of trapping information, Preble's mice are assumed to occupy appropriate habitat throughout Boulder County.

During 2002, the USFWS proposed critical habitat for the Preble's mouse (67 CFR 47154). On June 23rd of 2003, the USFWS finalized the critical habitat ruling for the Preble's mouse (68 FR 37275). The final rule excluded the Rocky Flats Environmental Technology Site from critical habitat designation because the Site will become a USFWS National Wildlife Refuge after closure.

4.2 Routine Activities

The following routine activities occur in or adjacent to current Preble's protection areas. These activities are restricted within the boundaries of the Site, and do not affect surface water volumes. Potential impacts to threatened or endangered species are discussed for each activity.

4.2.1 Ecological Monitoring

Ecological monitoring evaluates the status of wildlife and plant communities to provide information used to ensure that operations at the Site remain in compliance with state and federal statutes and regulations, and for natural resource management. The monitoring program entails numerous surveys throughout the BZ as well as the IA. Several driving surveys use existing BZ roads to access areas of interest on the Site. Many areas are inaccessible by road; in these cases, surveys are conducted on foot. Foot surveys are frequently conducted in current Preble's mouse protection areas. Additionally, aquatic sampling (largely fish trapping) is conducted periodically along streams and in ponds at the Site. These activities are not expected to adversely affect the Preble's mouse onsite, or are they expected to have effect on off-Site or downstream species. Best management practices are used to minimize disturbances to the habitat by Ecology Program activities.

As part of the Site's commitment to conserve the Preble's mouse, live trapping may be conducted annually in different drainages at the Site. This monitoring is performed under Section 10 of the sub-permit issued by the USFWS (dated 3/25/02, permit # TE051719-

0), and by permit from the Colorado Division of Wildlife (CDOW, dated 2/25/03, permit # 03-TR569). Copies of both permits are included in Part I, Appendix D.

4.2.2 Air Quality Monitoring

Air quality monitoring requires routine visits to 38 air sampling sites twice monthly, and to one meteorological tower location (two towers) on a weekly basis. Fourteen of the monitors are located on the Site's perimeter, three are off site in local communities, and 21 are located onsite around or in the IA. Each sampler is accessed via an existing road, and visits include activities such as changing filters, checking flow, and calibrating instruments. Eight of the samplers at the Site are located in current Preble's protection areas. Occasionally, if vegetation gets tall around the sampler location itself, a weed whacker is used to trim the weeds to approximately 6-8 inches in an area extending about five feet from the sampler to allow access and proper operation of the sampler. As Site closure draws closer, electrical power may be shut off to these samplers. Should that occur, small gasoline powered generators will be required to provide power to the samplers, because solar power is not sufficient to provide the power needed to operate the samplers. The generators are the typical type that can be purchased at local hardware stores and operate using lawnmower size engines. The generators would only be operating during normal daylight working hours, unless a project was working into the evening and required longer hours of monitoring. But this is an unlikely scenario. If this occurs, a temporary impact to the habitat would occur where the generator is located and additional trips to the samplers will be required to refuel the generators. A small amount of additional noise would result from the generators, however, because the samplers themselves create a loud whining noise during normal operation, no effect on the mouse from the noise is expected.

Eventually the air samplers will be removed. This will involve driving to the locations, as is done for normal monitoring, removing the samplers from the poles, and later having the power poles removed. The power pole removal activities are discussed in section 4.3.8 of Part I of the PBA.

Because no disruptive actions are taken during visits (other than minimal weed trimming around samplers as needed) and additional activities will occur largely on the roads to and from the samplers there will be no adverse effect on the Preble's mouse.

The meteorological tower, located west of the IA, is visited weekly to download data, and is calibrated over a two- to three-day period twice a year. The tower will be taken down prior to Site closure. The tower and associated structures are located on the pediment top, and not in the current Preble's protection areas, therefore no impact to the Preble's mouse or other listed species will result from this activity. Air quality monitoring activities do not affect surface waters; therefore, there will be no effect from this activity on listed lower Platte River species.

4.2.3 Routine Pond Operations

Routine pond operations encompass the transfers of treated wastewater and stormwater between interior ponds, and discharges from the terminal ponds, in the A-, B-, and C-series detention ponds. Proper management of pond operations is necessary to ensure compliance with the Clean Water Act and RFCA. Routine dam monitoring is accomplished by weekly visual inspection and reading of pond levels and piezometers, and by continuous telemetry reading. This monitoring is done from access roads or by foot where roads do not exist. Pond discharges are typically conducted when pond levels reach a certain level. This height can vary, however, based on weather forecasts and other extenuating circumstances. Ponds are usually discharged as batch releases at specified rates (typically a one foot drop in water height per day) although this could vary depending on the situation. The number of annual batch releases varies depending on climatic conditions.

Routine maintenance of dams includes minor repairs and maintenance of the A-, B-, and C-series and East Landfill Pond dams, and includes activities such as dam road grading and maintenance, vegetation removal within the riprap areas of the dams (either mechanical or herbicide), vegetation trimming and vegetation mowing. Dam maintenance, as required by the State Engineer's Office (SEO) and DOE Orders, is necessary to maintain dam safety and integrity. Failure to adequately maintain dams could result in an unscheduled release, potentially resulting in non-compliance with the RFCA, NPDES permits, or threatening the safety of downstream persons, the environment, and property. Additionally, a dam failure would potentially destroy Preble's habitat downstream. Therefore, a balance between dam safety and maintenance versus the protection of the Preble's mouse is required. Vegetation management is an integral component of the dam maintenance and safety program.

Mowing (or burning) on dams and spillways of Site water management ponds has been a routine activity since the 1970s. Federal Energy Regulatory Commission (FERC) inspectors visit the Site annually to inspect dams for safety and maintenance. These inspections are required for compliance with the Bureau of Reclamation and Colorado State Engineer safety regulations. Clearing of vegetation is necessary to prevent the vegetation from obstructing from view potential structural problems in the dam.

Vegetation management activities mentioned above have already been consulted on, and will follow the guidance provided in the BE entitled *Vegetation Management on Water Control Structures and Related Actions in Preble's Mouse Habitat* (DOE 2001; Part I, Appendix C) and USFWS concurrence letter (concurrence letter dated, November 27, 2001; Part I, Appendix C). Actions of this project will not adversely affect the Preble's mouse or its habitat.

In addition to the above concurred upon actions, actions to move or replace riprap on the dam faces may occur in order to keep the dams functional, safe, and in good operating condition. Existing riprap that has shifted over time might need to be moved, or riprap

will need to be replaced. Riprap movement would be restricted to areas where riprap already exists. Areas with existing riprap are accessible from existing roads. Vegetation on any riprap areas is sparse and the current Preble's mouse survey guidance (USFWS 1999) does not recognize riprap as preferred habitat, nor does the Site data indicate that Preble's mice use riprap as preferred habitat. Therefore, since the riprap areas are not considered Preble's habitat and the riprap areas can be accessed from existing roadways and dam crests, the riprap repair activity, although it may affect the mouse, it is not likely to adversely affect the mouse.

Additional vegetation management actions necessary for dam safety inspections are addressed in Part II of the PBA.

4.2.4 Routine Road Maintenance, Road Repair, Grading, and Mowing

Buffer Zone roads and utilities are maintained routinely to ensure that roads are safe for use, and that utilities remain in good operating condition. When dirt and gravel roads become eroded, grading restores proper drainage and reduces siltation that otherwise could reach streams and affect the aquatic ecosystem. Some BZ roads serve as fire breaks, providing barriers to interrupt the spread of grassland wildfires that occasionally occur in the BZ. These roads also serve as access routes for emergency vehicles such as fire protection equipment and Site security forces, as well as groups who perform various environmental monitoring activities (e.g., surface water, groundwater, air quality, and ecology).

Some road grading and road edge mowing occurs in and adjacent to current Preble's protection areas. This road maintenance has been conducted routinely for 25 to 50 years, depending on location. Areas where roads are adjacent to or cross Preble's mouse habitat have been maintained by annual grading for most of the last 50 years. Road grading activities will not widen the current width of the roads within Preble's habitat. Mowing along the roads within Preble's habitat will not extend beyond 20 feet from the edge of the road.

No effects from the road maintenance activities are expected to any of the species under consideration in this PBA, including the Preble's mouse, because roads are not considered suitable Preble's habitat.

4.2.5 Weed And Vegetation Management

Weed management in the Rock Creek drainage will follow the BA for natural resource management (including weed control) that was written for the Rock Creek Reserve in the north BZ at the Site in 2001 (USFWS 2001a; Part I, Appendix C). The Biological Opinion (BO; USFWS 2001b; Part I, Appendix C) for this BA stated that a maximum of three acres in the Rock Creek Reserve could be treated annually with noxious weed control/herbicides with no adverse effects to the Preble's mouse. The BO also gave approval for up to three acres of prescribed burning annually within Preble's habitat in Rock Creek.

Weed management in Preble's habitat outside of Rock Creek will consist of biological control insect releases and weed management required by the USFWS for project mitigation areas. Weed management in project mitigation areas are required to meet success criteria set by the USFWS. At this time, no other weed management activities are planned in Preble's habitat at the Site.

4.2.6 Well Abandonment And Replacement Program

The Well Abandonment and Replacement Program (WARP) ensures that wells associated with the GMP, environmental restoration, decommissioning, and other site closure projects are properly abandoned to protect groundwater quality and comply with State of Colorado Well Construction Rules (2 CCR 402-2). WARP also provides for installation of replacements for damaged GMP wells to maintain compliance with RFCA groundwater monitoring requirements.

Ultimately, WARP will accomplish the abandonment of about 700 or more permitted wells across the Site, leaving only those wells that will be retained for long-term groundwater monitoring. Well abandonments, through Site closure, located in current Preble's protection areas have been addressed and concurred with through a separate consultation with the USFWS (DOE 2002a; USFWS concurrence letters dated February 24, 2003 and April 9, 2003; Part I, Appendix C). Well abandonments in the Rock Creek drainage in current Preble's protection areas were addressed in a biological evaluation in 2002 and concurrence letter from the USFWS (DOE 2002b; USFWS concurrence letter dated September 12, 2002; Part I, Appendix C). In December of 2003, a new Preble's mouse protection area map was made effective (Appendix A of Part I of the PBA). This map increased the size of the protection areas in some spots along the drainages on Site, thereby possibly including more wells in the protection area. Removal of wells that fall in this category will follow methods outlined in the previous BEs and Bos listed above.

4.2.7 Removal of Concrete Pads from Abandoned Wells

Prior to 1998, a concrete pad with an identifying tag was placed at each abandoned borehole or well location. As part of the Site cleanup, these old concrete pads will be removed from the BZ. The concrete pads range from a circular concrete pad 6 inches in diameter, to those about 4 by 4 foot in size. The old pads will require less work than abandoning wells. The smaller pads will require little more than a sledge hammer to remove the concrete. The 4 by 4 foot concrete pads will require a forklift to be driven to the area. The forklift will lift the pad, and move it out of the area. The only vehicle that will need to approach the concrete pads will be the forklift, and it will only be driven in and out of the area one time. Well abandonments have previously been approved by the USFWS (DOE 2002a, 2002b; USFWS concurrence letters dated September 12, 2002, February 24, 2003, and April 9, 2003; Part I, Appendix C). Removal of these pads will follow the same methods outlined in the previous BE's. By using best management practices, impact to the Preble's mouse habitat will be minimized and no adverse effect will occur from the concrete pad removal activity. Additionally, the removal of the

concrete pads and re-establishment of native vegetation will increase the amount of habitat available for the Preble's mouse at the Site.

4.2.8 Subsurface Soil Sampling

Subsurface soil sampling is conducted at many locations where characterization of below ground soils is needed. Most of this occurs in the IA where sampling is needed around the buildings or for other remediation activities. Sampling is typically conducted with a geoprobe type sampler mounted on a truck or small Bobcat type piece of equipment. The geoprobe pushes (hammers) a tube into the ground to the required depth. The tube and soil core (up to 3.75 inches in diameter) is removed and the required soil taken for analysis. The hole is filled with granulated bentonite (clay). If any subsurface soil sampling has to be done in Preble's habitat, best management practices would be used to minimize any impacts. Typically only the geoprobe vehicle would be driven off-road to the sample location unless another support vehicle is needed for carrying the soil samples. So the only disturbance to the habitat would be from vehicle tracks off-road, foot traffic during sampling, and the small borehole. No adverse effect to the Preble's mouse is expected from this activity.

4.2.9 Groundwater Treatment System Monitoring

The Solar Pond, East Trenches, Mound, and 881 Hillside groundwater treatment systems are groundwater collection and treatment structures designed to capture and treat contaminated groundwater. The Solar Pond treatment system is located beneath the north access road north of the Solar Ponds location. The East Trenches treatment system runs beneath and north of the road along the south side of the B-series ponds. At both of these locations the area on the north sides of the roads is grassland that has been revegetated. The Mound treatment system is located beneath the grassland on the hillside south of the 995 complex (sewage treatment plant) and South Walnut Creek. Portions of the Solar Pond, 881 Hillside, and Mound treatment systems and all of the East Trenches treatment system are within the current Preble's protection areas. The 881 Hillside treatment system has already been decomissioned and closed out. The grasslands at the remaining three locations provides some low quality habitat (mostly revegetated) away from the streamside. The above ground portions of both systems consist of several well heads, treatment cells, and water discharge locations. Maintenance of the systems involves collection of water samples from the wells and discharge locations, and removal of the iron filings used to treat the water in the treatment cells. Iron filings are removed from the treatment cell through the use of a vacuum system or a backhoe. Maintenance may also require selective excavation of discharge piping. Excavation of discharge piping will most likely involve a backhoe or trackhoe piece of equipment to remove the discharge pipe from the previously disturbed low quality habitat. Excavations would be the minimum necessary to address piping issues. At the Solar Ponds, the pipe runs beneath a gravel road/parking area and would disturb essentially no actual habitat. For the East Trenches and Mound pipe areas (also located in previously disturbed areas) the overall disturbance would be less than 0.02 acres total. Roads access all of the wells, treatment cells and water discharge areas. Some additional area around the treatment cells is

necessary for bringing in the equipment necessary to replace the iron filing every few years. During 2003, the iron filings needed to be replaced at the East Trenches treatment system and a BE was written for consultation with the USFWS (BE dated 9/19/03, Appendix C of Part I of the PBA). The USFWS visited the site and concurred that the additional area and work required to complete the maintenance activities did not constitute an adverse affect (concurrence letter dated 10/6/03, Appendix C of Part I of the PBA). Future maintenance activities would follow the general guidelines and protocols followed for the East Trenches maintenance. If future planned activities exceed those outlined in the East Trenches BE, further consultation with the USFWS would be pursued. Current plans leave the treatment systems in place and functioning after Site closure. These monitoring and maintenance activities are expected to have no adverse effect on the Preble's mouse or other species under consideration in the PBA. When the Solar Pond and East Trenches Treatment Systems were installed the disturbances were seeded with big bluestem, little bluestem, western wheatgrass, side-oats grama, blue grama, buffalo grass, and blue flax.

As part of the IA Regrading Plan an additional groundwater treatment system may be installed between Buildings 371 and 771. No specific details are currently available on this proposed treatment system, however, the project would be completely outside current Preble's protection areas and would therefore have no effect on the Preble's mouse. Best management practices would be used to minimize and erosion or sedimentation problems in the streams.

Operation and maintenance of the Interceptor Trench System (ITS) was done by collecting ITS water (about 2,000,000–4,000,000 gallons per year) from the Solar Ponds Plume, storing water in the Modular Storage Tanks (MST), and transferring water to Building 374 for treatment through evaporation. These operations were stopped when the Solar Ponds treatment system was installed in 1999. The MST were removed in FY2003, however, they were not located within the current Preble's protection areas. Therefore the MST removal had no effect on the Preble's mouse or its habitat. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000). Potential water depletions resulting from operation of the Solar Pond Plume Treatment Project (SPPTP) are discussed in Part II of the PBA.

4.2.10 Trash Removal From Buffer Zone

Trash removal is an ongoing process in the BZ and the IA. High winds blow trash onto the Site from surrounding areas as well as from the IA. Trash usually gets trapped in fences or shrubs and trees in low areas of the drainages. Because the trash that blows in is usually light, it is usually removed by hand, then collected in vehicles parked on established roads before it is removed from Site. If it becomes necessary to drive a vehicle off an established road for trash removal purposes, only one vehicle is driven off the road, and the same tracks are used to enter and exit an area. Using best management practices, no effects are expected to any species under consideration in Part I of the PBA.

4.3 Specific Projects

4.3.1 B-4 Pond Building

A small building that holds a gauging station for monitoring water flows is located on the east edge of the B-4 pond dam. The building stands next to an established road on top of the B-4 dam and is located over the concrete spillway. It is however, located in current Preble's protection area. This structure may be removed. Removal should not require off-road driving since access can be made from the road crossing the dam. The total size of the building and surrounding area is about 30 feet by 30 feet. Best management practices will be used to minimize impacts to the current Preble's protection area. Any soil disturbance will be revegetated with native species.

4.3.2 C-1 Pond Rip Rap Pile

A pile of unused riprap is located to the northeast of the C-1 pond. The area is an old disturbed parking area previously used for riprap storage for projects along Woman Creek. The riprap is located adjacent to an established road and is surrounded by non-native vegetation (smooth brome). The area of the riprap pile is about 20 feet by 20 feet in size. If the riprap pile is removed, heavy equipment will be used to load the rock and transport it away. The equipment would remain on the previously disturbed area around the riprap pile. The ground will then be revegetated using native plant species. Best management practices would be used to prevent erosion and sedimentation problems.

4.3.3 Dirt Pile Along Walnut Creek Southwest Of Landfill

In the late 1970's to the early 1980's a borrow area was used west of the IA along Walnut Creek. A large gravel/dirt pile (about 30 feet by 40 feet) remains along Walnut Creek at that area within the current Preble's protection area. As part of the Site cleanup, the pile may be removed or pushed back into the borrow area. If done, the area will be revegetated with native species. The upper western reach of Walnut Creek is separated from the downstream reaches where the nearest populations of Preble's mice are known to occur near the A-series ponds by physical barriers including a parking lot, the north access road, a highly channelized ditch, and the stream going through several hundred feet of underground culvert. Therefore no adverse effect is expected to the Preble's mouse. Best management practices will be used to minimize impacts to the habitat and prevent erosion.

4.3.4 Pipeline Removal

Several aboveground pipelines are located in the BZ and used to pump water between ponds during normal pond operations. One of the pipelines runs from the East Landfill Pond near the Current Landfill to the A-1 pond. This line has been used to pump water from the East Landfill Pond to the A-1 pond. The southern portion of the pipeline runs partially through the current Preble's protection area. Two or three similar pipelines connect the A-series and B-series ponds. Until the pipelines are removed, they will

require occasional monitoring and maintenance. This will include visually inspecting the line on the grassland. However, no vehicles will be used off established roads. Prior to Site closure the pipelines will probably be removed.

The pipelines are buried underground only where they cross under roads in upland areas outside of Preble's habitat. Aside from using heavy equipment on the road to dig up the pipelines at these locations, no excavation will be required for removal of the rest of the pipeline. The pipeline sections will be separated or cut, pulled out of the area, and removed from the Site. T-posts used to hold the pipes in place on the hillside will also be removed. Only the minimum number of vehicles necessary to safely remove the pipeline will be driven off-roads to access the pipelines and remove them. Best management practices will be used to minimize impacts to the current Preble's protection area. Although the pipeline removals may affect the Preble's mouse, they should not adversely affect the Preble's mouse or its habitat.

4.3.5 Fence and T-Post Removal

Old interior fences and t-posts are located throughout the BZ. Fences include old wooden posts with barbed wire as well as newer steel t-post fences with barbed wire. Most fences and t-posts within the current boundary fence may be removed. Some of the areas where t-posts and fencing is to be removed occur in current Preble's protection areas. Approximately 18,000 linear feet of fenceline may be removed within current Preble's protection areas. Bobcat-like equipment or small backhoes may be used to pull out the posts from the ground. At some locations where this equipment cannot access the fences, hand removal may be required for safety purposes. Any barbed-wire may be wound up in coils. Both the posts and wire will be moved to an established road where they will be loaded onto vehicles or into a roll-off for removal. Only the minimum number of vehicles necessary to conduct the work safely will be driven off established roads. Best management practices will be used to minimize potential impacts to the current Preble's protection areas. Although the activity may affect the Preble's' mouse, it is not likely to adversely affect it.

4.3.6 Gravel/Riprap Storage Area

An area north of Walnut Creek and just east of the Shooting Range access road, has been used as a storage area for gravel, dirt, and riprap for many years. The area was originally used for onsite concrete mixing. The current piles of gravel and riprap are located in this disturbed area adjacent to an existing road, and will require heavy equipment for removal. The piles of material and the area is not suitable Preble's mouse habitat. However, it is located within the current Preble's protection area. Once the material is removed it, will be revegetated with native plant species. The area is flanked on the south and east by native coyote willow thickets. The shrubs will not be disturbed, nor will vehicles drive off the established roads. Best management practices will be used to minimize impacts to the current Preble's protection area. Vehicles and heavy equipment will remain on established roads and disturbed areas. No adverse effect to the Preble's mouse is expected.

4.3.7 Guard Rails Along Roads

Guard rails along the Site roads may be removed. Approximately 1,000 feet of the rails occurs current Preble's protection areas. Most of the area surrounding the guard rails is not high quality Preble's mouse habitat since it is usually a road on one side and gravel for a short distance or a road shoulder on the other side. Removal of the guard rails will most likely be accomplished at the same time as the removal of the roads. Disturbed areas will be reseeded with a native plant species. Best management practices will be used to minimize disturbances in the habitat. This activity will not adversely affect listed species.

4.3.8 Power Pole And Power Line Removal

As electrical service needs diminish at the Site, the need for electrical power lines and power poles to various locations is eliminated. Removal of power lines and power poles began in 2002. Power lines cross through current Preble's protection areas at several locations across the Site. Removal of the power lines within current Preble's protection areas involves driving bucket trucks to the base of the poles, lowering power lines to the ground, removing associated hardware from the poles, cutting the poles, and removing all the materials to be disposed of. Power line and power pole removals at the Site have been previously evaluated and approved by the USFWS. In 2002, two power line removals were approved (DOE 2002c, USFWS concurrence letter dated October 1, 2002; Part I, Appendix C). In 2003, an amendment to the 2002 biological evaluation was done to remove three more power lines in the BZ (DOE 2003). Future power line and power pole removal activities will follow the specifications outlined in the biological evaluations and concurrence letters previously used to conduct these activities at the Site. Although this activity may affect the mouse, it is unlikely that is will cause any adverse effect. No effect is expected on any of the other species listed for consideration under this PBA.

4.3.9 Security Force Buffer Zone Activities

The Site Security Force is responsible for protecting national security interests at the Site. This often involves patrolling various areas throughout the Site, including areas in the BZ. Depending on the current alert status, the amount of time spent patrolling the BZ varies. Generally the Security Force stays on the BZ roads. There have been instances where they have driven in current Preble's protection areas. Generally it is only noticed as a set of tire tracks going off-road. Until Site security requirements diminish and the need for the Security Force is gone, there may be situations where off-road driving will be required as a result of security responsibilities and emergency situations. Occasionally the Security Force holds training sessions, involving local law enforcement agencies, in the BZ. Training exercises are not allowed in current Preble's protection areas. Education of security force personnel will be conducted to inform staff of the importance of staying on established Buffer Zone roads because of the Preble's mouse. If accidental

damage to Preble's habitat result from emergency activities it would be mitigated by reseeding the areas with native plant species and using best management practices.

4.3.10 South Interceptor Ditch Maintenance

The South Interceptor Ditch (SID) prevents water coming off the pediment to the south of IA from going into the Woman Creek drainage. The water runs in the SID and into the C-2 pond. Routine monitoring of the SID for structural integrity is required. An established road runs on one or both sides of the SID banks. Monitoring entails driving on the ditch roads and inspecting the riprap and other ditch structures. Maintenance may include dredging portions of the ditch to allow free water flow or addition of riprap to areas within the ditch needing repair. These activities would be conducted from the established road that runs adjacent to the SID. Portions of the SID are located within the current Preble's protection areas. The SID is located on the hillside north of Woman Creek.

On October 1, 2002, the USFWS released a final rule (FR 67:61531) that provides private landowners an exemption to conduct ditch maintenance activities on their properties in Preble's habitat. These exemptions were provided to allow landowners to maintain water conveyance ditches so they function properly and continue to provide habitat for the Preble's mouse when in Preble's mouse habitat areas. The final rule allows for "normal and customary ditch maintenance activities that result in the annual loss of no more than ¼ mile of riparian shrub habitat within any one linear mile of ditch within any calendar year." The Site will follow the guidelines and direction allowed for ditch maintenance provided in the final rule for ditch maintenance activities for the SID.

It is unlikely that activities for maintenance of the SID will have an adverse effect on the Preble's mouse or other species under consideration in the PBA.

4.3.11 Temporary Surface Water Flume Projects

Surface water flumes are used at the Site to monitor water flows and to obtain automated grab samples for contaminant analyses as required by regulatory requirements or closure activities. Occasionally these are large concrete structures, but more often they are temporary fiberglass or metal flumes. Replacement of the concrete structures requires the use of heavy equipment and can take several weeks to complete the construction activities. The permanent flume replacements are discussed in Part II of the PBA.

Currently there are no temporary flume installations planned; however, the flumes are typically installed as part of the surface water monitoring required for specific projects. Typical size of the flumes are 5-8 feet in length and sit in the stream bottom. The temporary flumes are installed with hand tools; and this involves setting and leveling the flume in the center of the stream, anchoring the flume in the stream bottom, and setting up side walls made of plywood and plastic vinyl. Habitat disturbance needed to install these flumes is restricted to the stream bottom and two small linear trenches, dug with a shovel or pick, for the wing walls. Soil disturbance (from shovel or pick) is

approximately 8 square feet. Occasionally a few shrubs are trimmed to allow installation. The temporary flumes are installed in one or two days and only require a vehicle to drive the equipment to the stream edge once. Disturbed areas are reseeded with native plant species and future monitoring is conducted on foot, unless the flume happens to be located along the edge of an established road or two-track.

During 2002, a biological evaluation was prepared and submitted to the USFWS for concurrence regarding a temporary flume installation in Woman Creek (K-H 2002c). The USFWS gave approval for the project in a concurrence letter (USFWS concurrence letter dated October 16, 2002; Part I, Appendix C). Future temporary surface water flume installations would be conducted in similar fashion as the 2002 installation. Best management practices would be used to minimize disturbance and impacts to the current Preble's protection areas. Currently no plans exist to install any of these flumes within current Preble's protection areas between now and closure, but the evaluation was made to include the worst case scenarios.

4.3.12 Buffer Zone Concrete Removal/Incinerator Project

Several areas below the pediment top to the south of the 130 trailer complex were used to dump cement earlier during the Site's history. Removal of the cement flows was begun in April 2003. A part of the lower cement flow was located in the current Preble's protection area. A separate BE was written to cover this project and a concurrence letter approving work within the current Preble's protection areas was received from the USFWS on April 28, 2002. Copies of both of these documents are found in Part I, Appendix C. Project changes and issues that have emerged after the initial BE and concurrence letter are being consulted on with the USFWS outside of the PBA.

East of the 903 Pad along the edge of the pediment another area of past concrete dumping exists. This area however, is outside current Preble's protection area and will have no effect on the Preble's mouse. For all cement removal projects, best management practices will be used to minimize disturbances to the current Preble's protection areas.

5. Activities Not Covered By The PBA

5.1 Site Easement Issues

Numerous easements exist at the Site for utilities such as power lines, gas lines, and telephone lines. Also water conveyance ditches for water rights owned by non-DOE parties cross the Site at various locations (McKay Ditch, Mower Ditch, Smart Ditch – D-Series Pond water rights). Mineral rights and mining operations are also present at the Site at some locations. Currently no planned activities at the Site related to these easements are scheduled. The responsibility for USFWS consultation for potential impacts to listed species resulting from normal operations, maintenance, and new construction activities related to these easements at the Site, are ultimately the responsibility of the easement parties and would be dealt with through separate consultation with the easement parties, DOE, and the USFWS. Some specific easement activities are discussed below.

5.1.1 McKay Ditch Bypass Monitoring And Maintenance

Maintenance and monitoring activities on the McKay Ditch and bypass are conducted regularly to make sure the ditch continues to function as a water conveyance structure across the Site. Monitoring consists typically of driving (where roads or two-tracks exist) or walking along the ditch. Maintenance typically involves checking and setting valve settings when the City of Broomfield has water flowing in the ditch. Typical flow periods are early to mid-summer. Checking and setting of valve settings is done on foot by walking from the nearest road to the control structures. No effect is expected to the Preble's mouse or the other species under consideration in this PBA. However, if the City of Broomfield intends to do work beyond this described or that has the potential to adversely affect the Preble's mouse or its habitat, the responsibility for consultation will fall to the City of Broomfield and DOE and is not considered under this PBA.

5.1.2 Smart Ditch Bypass Monitoring And Maintenance

The Smart Ditch bypass is a small concrete and wooden structure that diverts water from Smart Ditch to the D-Series ponds and other off-Site ponds used for downstream irrigation or other uses. Maintenance and monitoring activities would involve replacing or adjusting the wooden boards used to direct water flow. The area is accessed on foot. The water flows in this drainage come primarily from Rocky Flats Lake, southwest of the Site, and the water rights are owned by private parties. No effect to Preble's habitat or the listed species under consideration is expected from this activity. Any activities beyond these stated here that have the potential to adversely affect the Preble's mouse or its habitat, are not considered under this PBA and will require additional consultation with the USFWS by the appropriate parties.

5.1.3 Mower Ditch Bypass

The Mower Ditch Bypass runs to the north of Woman Creek below the C-2 Pond. The Mower Ditch was used to divert water from Woman Creek to Mower Reservoir east of Indiana Street. The bypass is located within the current Preble's protection area. Occasional maintenance or monitoring is necessary for the proper operation of the bypass structure. These activities can be largely conducted on foot. Any activities beyond these stated here that have the potential to adversely affect the Preble's mouse or its habitat, are not considered under this PBA and will require additional consultation with the USFWS by the appropriate parties.

6. Cumulative Effects

The Endangered Species Consultation Handbook (USFWS 1998) defines cumulative effects as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 CFR §402.02). A description of the surrounding lands and activities conducted on those lands is presented below.

The Site is surrounded by private, city, county, state, and federal lands. A variety of land use activities occur on these lands. The land to the south of the Site is privately owned rangeland. It is currently used for grazing cattle. However, there are plans to develop portions of these properties as residential subdivision and business developments. The State of Colorado School Board land in Section 16 is also primarily rangeland, grazed by cattle throughout different times of the year. Gravel mining has occurred on this property in the past, however, none has taken place in recent years. The lands between Highway 93 and the mountain front to the west are largely City of Boulder, Boulder County, and Jefferson County open space properties used for some grazing and recreation activities. No development is planned for these areas. Between the Site and Highway 93 there is a narrow strip of private property that the current landowner has attempted to develop in the past, with no success. If development would occur, it would most likely be some type of small business (either office space or perhaps light industry). On the western edge of the Site, within Site boundaries, two gravel mine operations are currently active. Current plans, dependent on permitting, would mine much of the western portions of the BZ at the Site.

The northwest corner of the Site is bounded by the NREL. Research on renewable wind energy is conducted at the facility. Most activities involve the installation and removal of large wind generators. To the north, the Site is bordered by City of Boulder and Boulder County open space property. On the east, most of the land is City of Broomfield and City of Westminster open space property. A small amount of development (housing and office space) has occurred along Highway 128 east of Indiana Street. Along the eastern edge of the Site, there is a measure included in the Rocky Flats Wildlife Act that would allow a 300 foot corridor for development of the C-470 highway.

Because most of the surrounding land use is either rangeland or open space, no cumulative effects are expected to the Preble's mouse from these lands. These lands actually provide additional buffer areas around the Site as habitat. Where riparian habitat exits on some of these properties, steps (e.g. the use of fencing to keep cattle away from the streams) have been taken to preserve and enhance these corridors as wildlife habitat. Development activities planned for private property around the Site edges would be away from drainages at the Site and would have minimal or no effect on the mouse habitat at the Site.

The gravel mining operations on the western edge of the Site pose a potential undefined threat to the Preble's mouse habitat at the Site. It is currently unknown as to how or whether the mining operations might impact hydrologic conditions at the Site. Groundwater flows from the west provide water to the many seeps or stream flows that sustain Preble's habitat at the Site, particularly in the Rock Creek drainage. Because the drainages on Site lie largely at the headwaters of their respective watersheds, mining could potentially alter the groundwater water and surficial water flows on the Site. Currently, however, no data are available to make definitive statements about what may or may not happen. In addition, the mine operator continues to renew mining permits in order to expand mining operations. Concerns about the Preble's mouse habitat could be raised during the permitting process.

The proposed C-470 highway would potentially cut off the eastern most edges of the Preble's habitat at the Site in both the Walnut Creek and Woman Creek drainages. However, the habitat at these locations is of much lower quality than that found further west in either drainage. No mice have been captured within the area that would potentially become the highway. Currently, there are no specific plans to develop the C-470 highway along the eastern edge of the Site. As plans for the highway are developed in the future concerns about the Preble's mouse habitat could be raised during the planning process.

Numerous easements exist at the Site for utilities such as power lines, gas lines, and telephone lines. Also water conveyance ditches for water rights owned by non-DOE parties cross the Site at various locations (McKay Ditch, Mower Ditch, Smart Ditch – D-Series Pond water rights). Mineral rights and mining operations are also present at the Site at some locations as mentioned above. Currently no planned activities at the Site related to the these easements are scheduled. The responsibility for USFWS consultation for potential impacts to listed species resulting from normal operations, maintenance, and new construction activities related to these easements at the Site are the responsibility of the easement parties and would be dealt with through separate consultation with the USFWS.

Activities in areas surrounding the Rocky Flats Environmental Site will have no effect on DOE activities related to the cleanup of the Site.

7. Analysis Of Impacts

7.1 Definitions

The following definitions, cited from the Endangered Species Consultation Handbook (USFWS 1998), were used in categorizing the effects from actions discussed in Part I of the PBA on the selected threatened or endangered species considered in Part I of the PBA:

- "*No effect*" — the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.

- "*May affect*" — the appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a "may affect" situation exists, then they must either initiate formal consultation or seek written concurrence from the Services that the action "is not likely to adversely affect".

- "*Is not likely to adversely affect*" — the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial.

- "*Is likely to adversely affect*" — the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation.

- "*jeopardize the continued existence of*" — to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

7.2 Findings

The activities listed in Part I of the PBA will not affect water depletions within the greater Platte River basin. Therefore, no effects on the lower Platte River species are likely to occur from these on-Site actions. Lower Platte River species considered in this evaluation include the piping plover, the least tern, the whooping crane, the pallid sturgeon, the Eskimo curlew, the American burying beetle and the western prairie fringed orchid. Additionally, no effect from water depletions related to the Preble's mouse at the Site are likely, related to Site closure activities.

The bald eagle is a casual user of the Site. Site wildlife surveys have noted approximately one observation per year for the past six years. Bald eagle nesting has never been observed on Site. Therefore, DOE actions described in Part I of this PBA will have no effect on the bald eagle. Black-footed ferrets, boreal toads, Canada lynx, greenback cutthroat trout, Mexican spotted owls, mountain plovers, and Pawnee montane skippers do not occur at or near the Site. Ten years of ecological monitoring have never documented these species at the Site (DOE 1992, 1993, 1995; K-H, 1997c, 1998b, 1999b, 2000b, 2001b, 2002b; RMRS 1996). Therefore, the DOE actions described in Part I of this PBA will have no effect on these species. The black-tailed prairie dog occurs at the Site, but is a candidate species which is non-statutory and therefore is not considered in this PBA.

Ute ladies'-tresses, and Colorado butterfly plant, both listed species, though they occur in the Site's vicinity, have not been documented on the Site, nor in off-Site areas that might be affected by these actions (ESCO 1993, 1994). DOE activities described in Part I of this PBA will have no effect on these species.

7.2.1 Preble's Mouse Findings

The Preble's mouse occurs at the Site, and has been documented and studied extensively in each of the main drainages at Rocky Flats. Studies at the Site have focused on trapping and tagging Preble's mice, and tracking their movements through the use of telemetry. In addition, habitat characterization has been done to quantify habitat parameters at the Site. The data from these studies have yielded information on Preble's mouse habitat, areas of occupation, home ranges, and mouse movement at the Site. Using this information, Site ecologists developed a Preble's mouse protection plan (DOE 2000) that includes a Preble's mouse protection area map and a means of evaluating Site activities for potential impacts to the mouse. Appendix A to this section of the PBA outlines the methods that were used to delineate areas as Preble's mouse protection areas. These actions have been taken proactively by DOE to protect the Preble's mouse and its habitat at the Site. During 2002, the USFWS proposed critical habitat for the Preble's mouse (67 FR 47154). On June 23rd of 2003, the USFWS finalized the critical habitat ruling for the Preble's mouse (68 FR 37275). The final rule excluded Rocky Flats Environmental Technology Site from critical habitat designation. Therefore, project disturbances described in this PBA are based on the current protection areas mapped in Figure 5. Because the Preble's

mouse occurs at the Site, the major focus of Part I of the PBA has been on potential impacts to the Preble's mouse.

The majority of the projects listed in Part I of the PBA are scattered throughout the BZ and are not concentrated at a given location. The projects in Part I of the PBA fall under the criteria outlined at the beginning of the "no effect" and "may affect, but not likely to adversely affect" sections. These criteria include no permanent loss of habitat and limit soil and vegetation disturbances to that created by pulling of fence posts or guard rail posts, removing power lines, removing riprap piles, above ground pipelines, cutting of a few shrub stems to access a work area, or similar type small impacts. Therefore no adverse direct, potential additive, cumulative, direct, indirect, interrelated, and interdependent effects are expected to the Preble's mouse or its habitat from any of these projects.

Additionally, the final 4(d) rule for the Preble's mouse (67 FR 61531-61537) set forth a precedence that in principle if suitable habitat exists adjacent to a temporary project disturbance (i.e. ditch maintenance as addressed in the 4(d) rule), the action would "result in only minimal take of Preble's and is consistent with the protection and enhancement of Preble's habitat." Previous projects conducted in Preble's habitat at the Site during the active season of the mouse have shown the mice can co-exist near active project areas with little apparent impacts (DOE 1996, K-H 2000b). At both the B-4 dam toe slope sand/rock blanket project (DOE 1996) and the East Trenches treatment system project (K-H 2000b), trapping and/or telemetry studies during the project timeframes demonstrated that the Preble's mice continued to exist adjacent to the ongoing projects. For both of these projects heavy equipment, vegetation removal, soil disturbance, and excavation, were being conducted in current Preble's protection areas. At the East Trenches treatment system project, several hundred feet of Preble's habitat was disturbed along the entire B-series of ponds (B-1 to B-4). The USFWS concurred that the East Trenches treatment system project would not have an adverse effect on the Preble's mouse (USFWS concurrence letter dated January 22, 1999; Part I, Appendix C). In neither case, however, did the Preble's mice leave the stream reach where the project activities were taking place. Rather they continued to be captured in the traps and based on telemetry data continued to use the habitat adjacent to the project areas during the duration of the projects. Often the Preble's mice were found just across the silt fence from where project activities were taking place. The conclusions of these studies were that the mice would not be extirpated from areas where projects occurred provided that suitable Preble's habitat was available adjacent to the project areas.

Further evidence of the resilience of the Preble's mouse to disturbance was observed during the summer of 2002 in the Rock Creek drainage at the Site where a wildfire in February 2002 burned about 27 acres. Almost 2200 linear feet of the grassland and riparian vegetation on the north side of Rock Creek was burned along the stream edge. Of this, an additional 280 feet of habitat was burned completely across the stream where the fire crossed the stream and burned to the pediment top on the opposite side of the valley. Small mammal trapping was conducted in June 2002 and a set of 50 traps was

located in and adjacent to the burn area. Twenty-five traps were located on the north side of the fire (with nearly all the traps located in burned areas) and 25 traps located on the south side of Rock Creek in unburned habitat. Two Preble's' mice, an adult male and adult female, were captured about two meters from the edge of the burned area on the north side of the stream on different days. Additionally, while running the trap line one morning, an individual Preble's mouse was observed hopping along in the burn area. So a natural disturbance, much larger than any of the planned cleanup activities in Part I of the PBA did not extirpate the Preble's mouse from these areas since they stayed in the habitat adjacent to the wildfire and even ventured into the burn area.

Based on the potential impacts of the various DOE projects listed in Part I of the PBA (with regard to the current Preble's protection areas), the individual activities and their potential additive, cumulative, direct, indirect, interrelated, and interdependent effects are unlikely to adversely affect the Preble's mouse. Neither are they expected to jeopardize the existence of the Preble's mouse at the Site.

The following table summarizes the findings of Part I of the PBA.

Fauna	**Legal Status**	**No Effect**	**May Affect, No Adverse Effects**	**Adverse Effects**
American burying beetle*	LE	X		
Bald eagle	LT	X		
Black-footed ferret	LE	X		
Black-tailed prairie dog	C	X		
Boreal toad	C	X		
Canada lynx	LT	X		
Eskimo curlew*	LE	X		
Greenback cutthroat trout	LT	X		
Least tern *	LE	X		
Mexican spotted owl	LT	X		
Mountain plover	PT	X		
Pallid sturgeon*	LT	X		
Pawnee montane skipper	LT	X		
Piping plover*	LT	X		
Preble's meadow jumping mouse	LT	X	X	
Whooping crane*	LE	X		
Flora				
Colorado butterfly plant	LT	X		
Ute ladies'-tresses	LT	X		
Western prairie fringed orchid*	LT	X		

* = Lower Platte River species
C = Candidate for listing LE = Listed endangered
LT = Listed threatened PT = Proposed threatened

Should any of the Site activities listed in Part I of the PBA change in scope, function, or process from what is presented in this document, further consultation (informal or formal) with the USFWS will be pursued.

8. Summary

This PBA is prepared by DOE to address the potential for Site activities to affect listed threatened and endangered species that are protected under the ESA. Part I of the PBA has been prepared to examine impacts from routine, ongoing activities, and specific closure actions on threatened and endangered species in the vicinity of the Site and in the lower Platte River drainage. The activities and actions addressed in Part I are those that will have either "no effect" or "may affect, but are not likely to adversely affect" species under consideration in this PBA or the Preble's mouse or its habitat. Part II of the PBA addresses actions that are "likely to adversely affect" the species under consideration in this PBA or the Preble's mouse or its habitat. It includes the discussion of water depletion issues.

The species evaluated in the PBA include the American burying beetle*, Bald eagle, Black-footed ferret, Black-tailed prairie dog, Boreal toad, Canada lynx, Eskimo curlew*, Greenback cutthroat trout, Least tern *, Mexican spotted owl, Mountain plover, Pallid sturgeon*, Pawnee montane skipper, Piping plover*, Preble's meadow jumping mouse, Whooping crane*, Colorado butterfly plant, Ute ladies'-tresses, and Western prairie fringed orchid*. Species noted with an (*) are South Platte River species.

There will be no effect from any of the activities listed in Part I of the PBA on the species evaluated, with the exception of the Preble's mouse. Although some activities listed in Part I of the PBA may affect the mouse, it is unlikely that the activities will adversely affect it.

As Site closure proceeds, the activities listed in Part I of the PBA should be able to continue without delays from ESA issues. Should any of the Site activities listed in Part I of the PBA change in scope, function, or process from what is presented in this document, further consultation (informal or formal) with the USFWS will be pursued.

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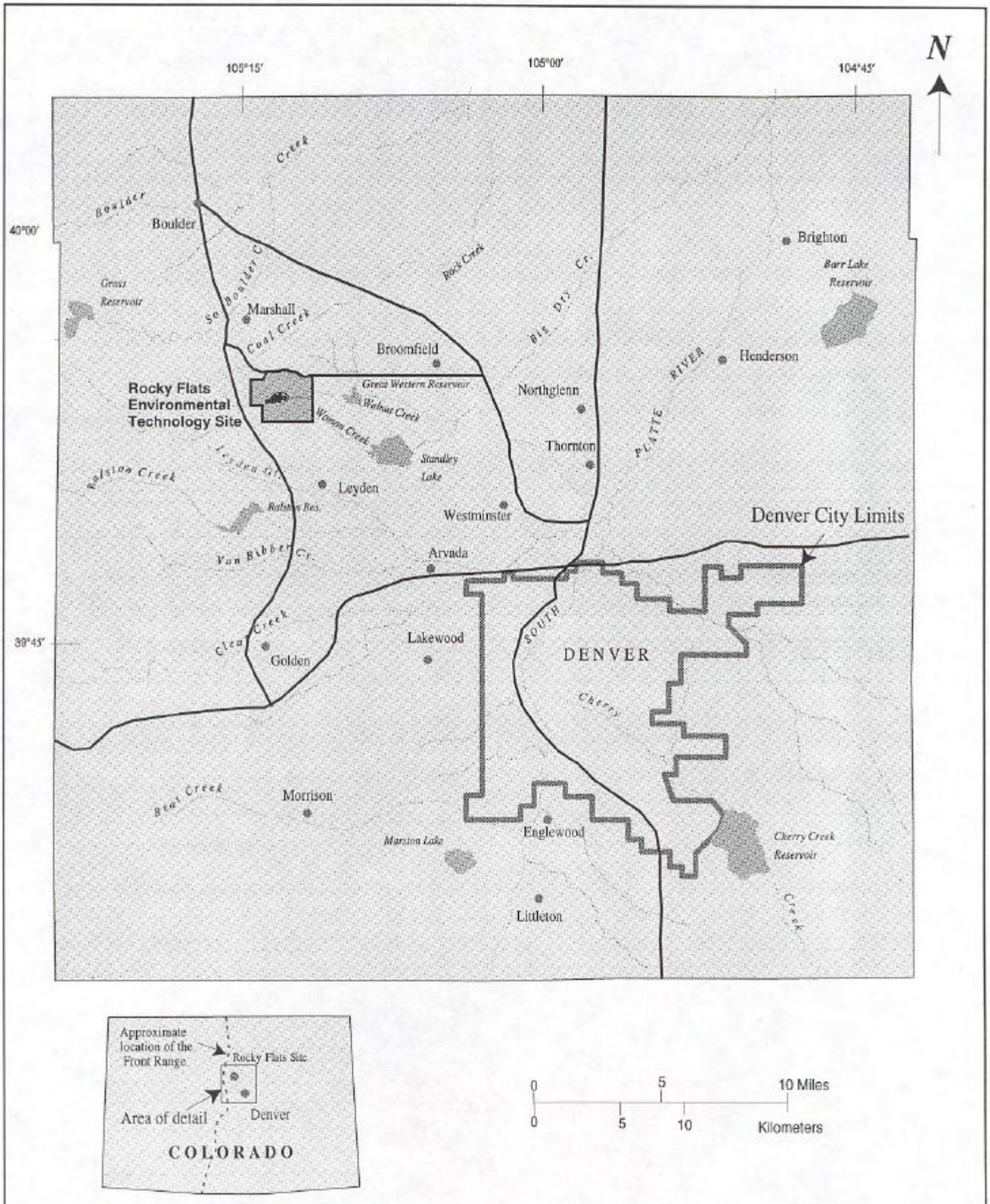

Figure 1

LOCATION OF THE ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

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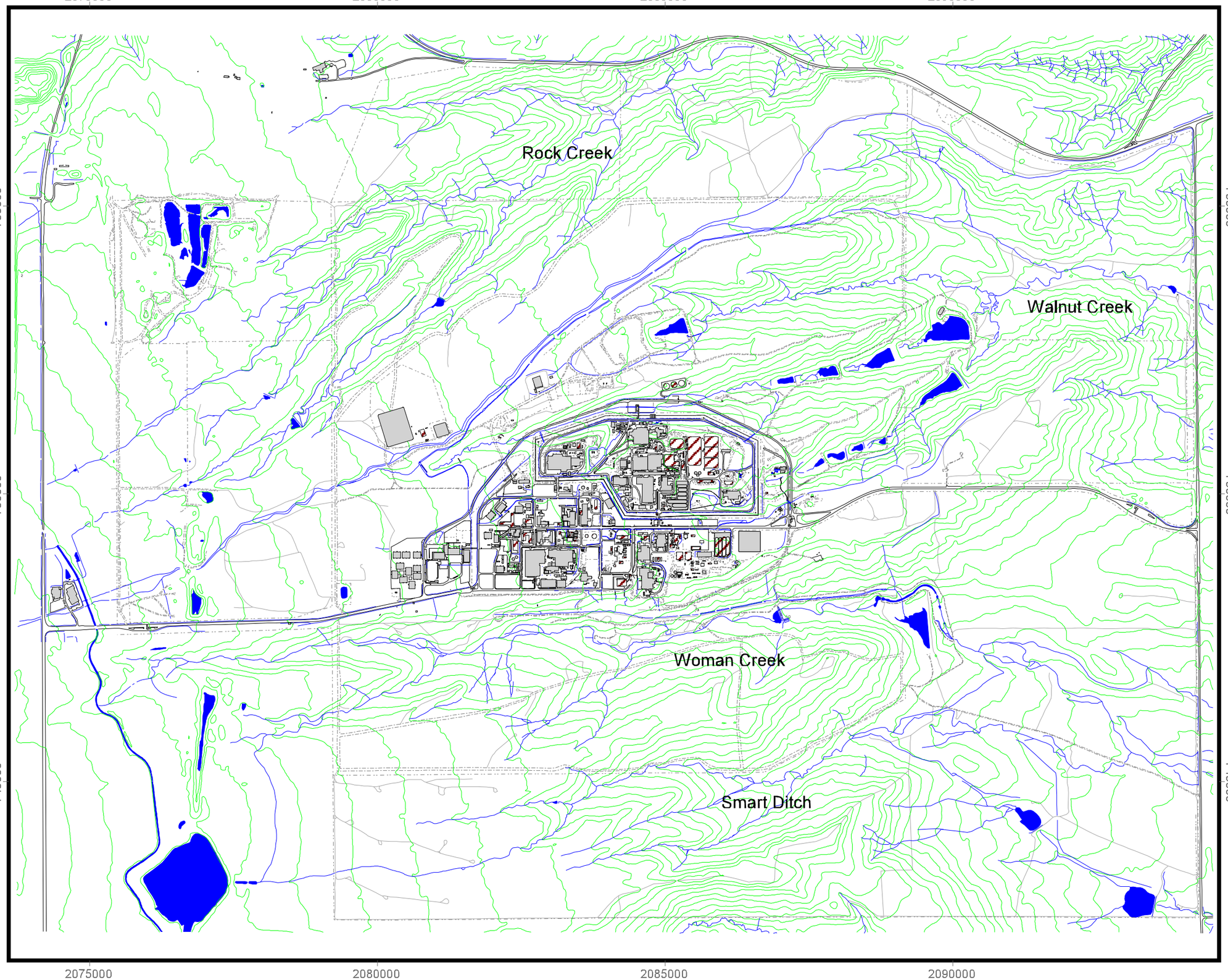

Rocky Flats Environmental Technology Site

Figure 2

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: LABAT-ANDERSON INCORPORATED

For: Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID:

March 10, 2003

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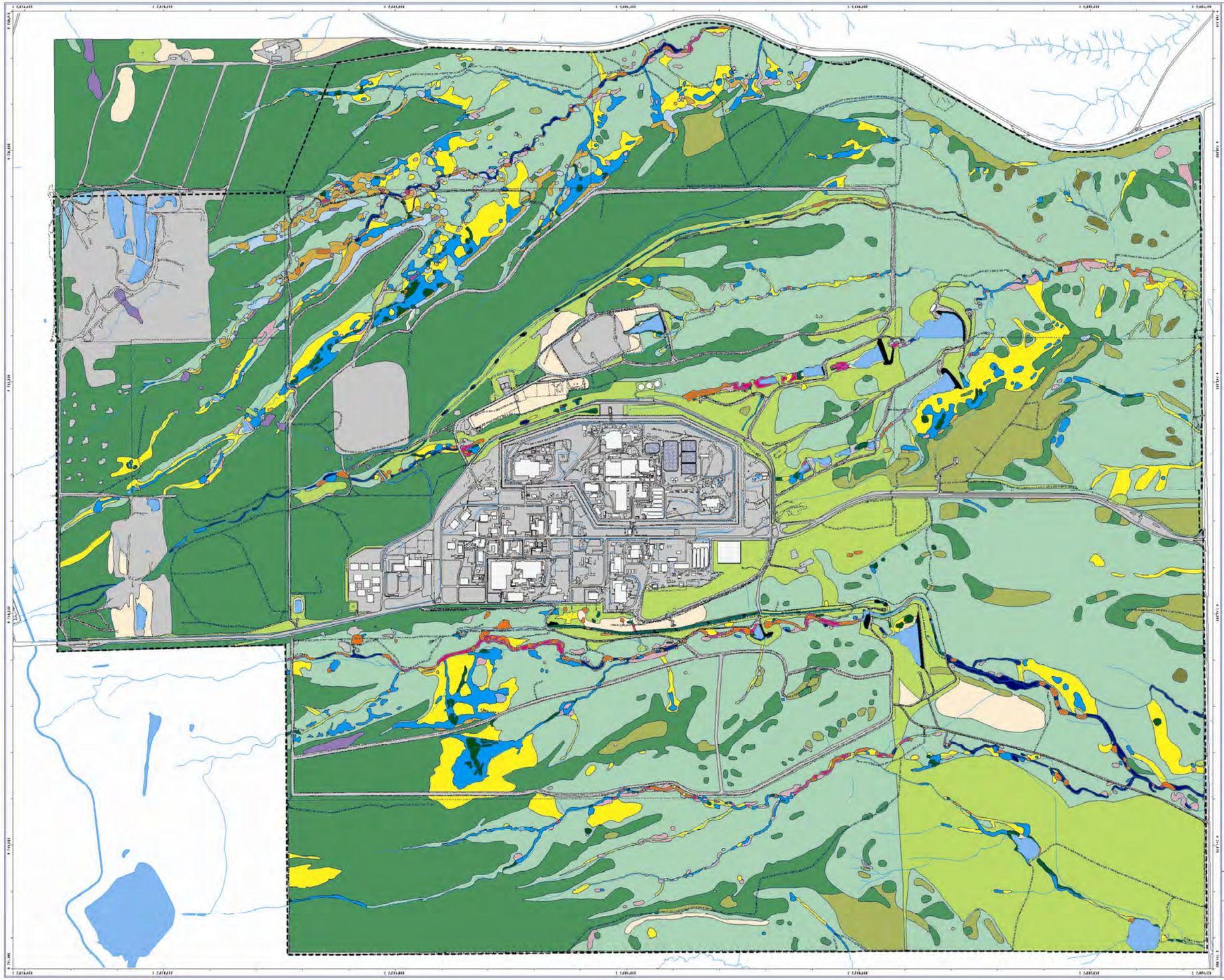
Rocky Flats Environmental Technology Site
Vegetation Map

Figure 3



LEGEND

- Riparian Woodland
- Leadplant Riparian Shrubland
- Wet Meadow/Marsh Ecotone
- Short Upland Shrubland
- Willow Riparian Shrubland
- Annual Grass/Forb Community
- Xeric Tallgrass Prairie
- Ponderosa Woodland
- Reclaimed Mixed Grassland
- Mesic Mixed Grassland
- Savannah Shrubland
- Tall Upland Shrubland
- Short Marsh
- Xeric Needle and Thread Grass Prairie
- Short Grassland
- Disturbed and Developed Areas
- Open Water
- Riprap, Rock, and Gravel Piles
- Mudflats
- Tree Plantings
- Tall Marsh

Standard Map Features

- Buildings and other structures
- Solar evaporation ponds
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCE:
Vegetation map data provided by
FTI Environmental Services
Golden, Colorado.
Buildings, fences, hydrographs, roads and other
structures from 1994 aerial fly-over data
captured by EDAW/AIS, Las Vegas
Digitized from the orthophotographs 1995

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Scale = 1 : 7200
1 inch represents 600 feet

0 600 1200ft

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD27

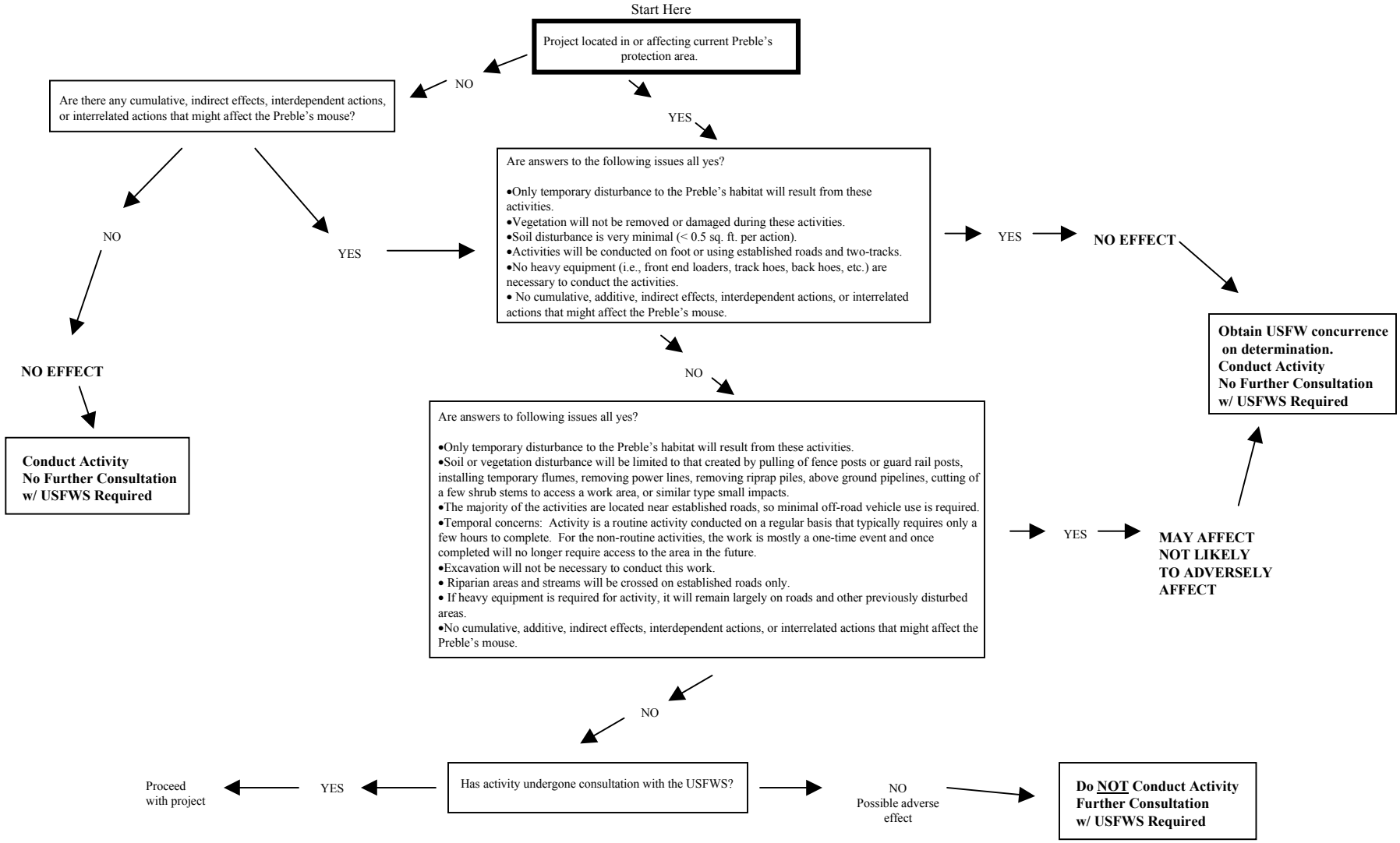
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS
Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

MAP ID 98-0208

August 14, 1998

Figure 4. Project Activity Preble's Mouse Impact Determination Flowchart



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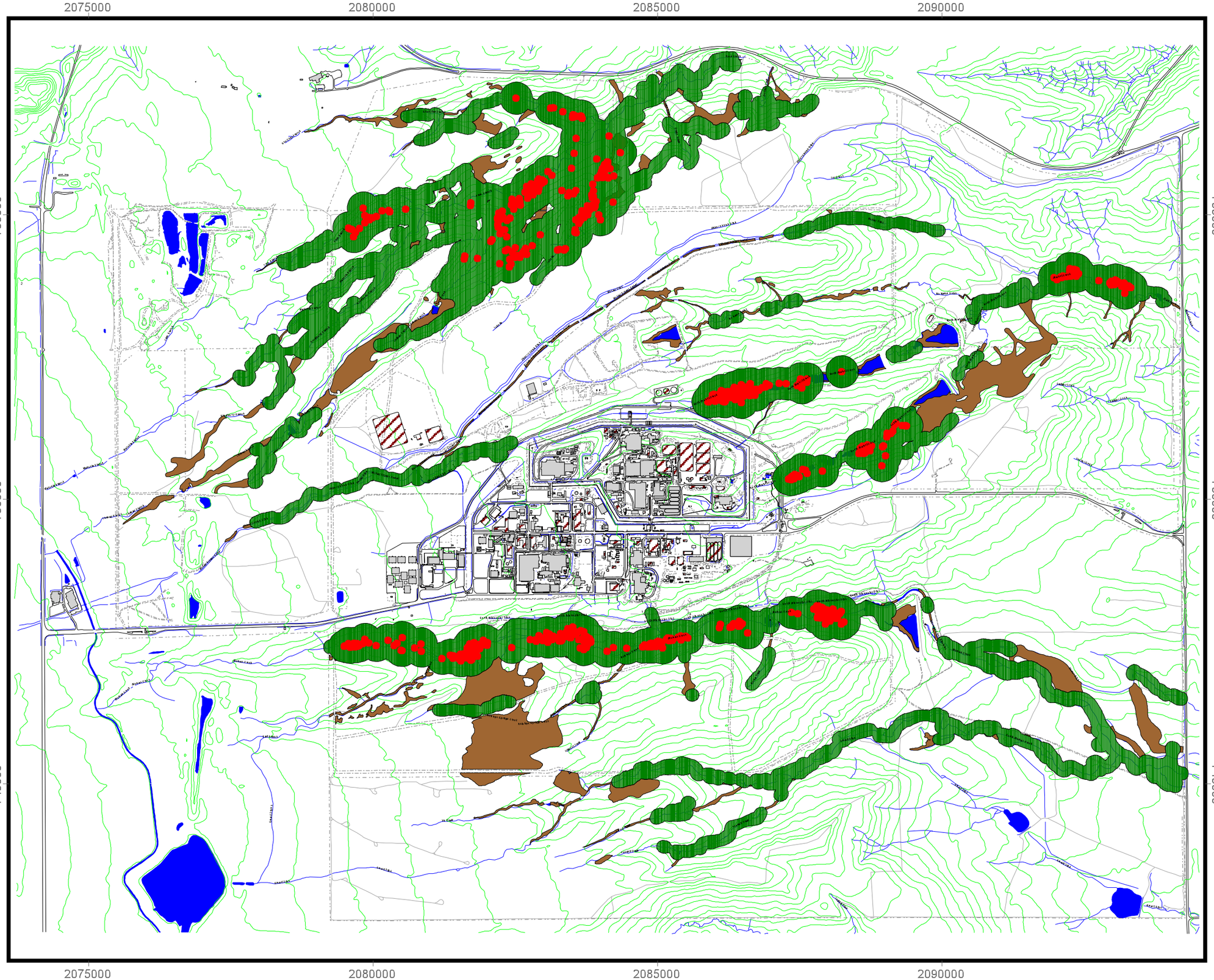
Preble's Meadow Jumping Mouse
Current Protection Areas
at RFETS
December 2003

Figure 5



Legend

- Current Preble's Protection Areas
- Contiguous Wetlands
- Preble's mouse telemetry points

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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For: Kaiser-Hill Company, LLC

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MAP ID: 04-0006

December 16, 2003

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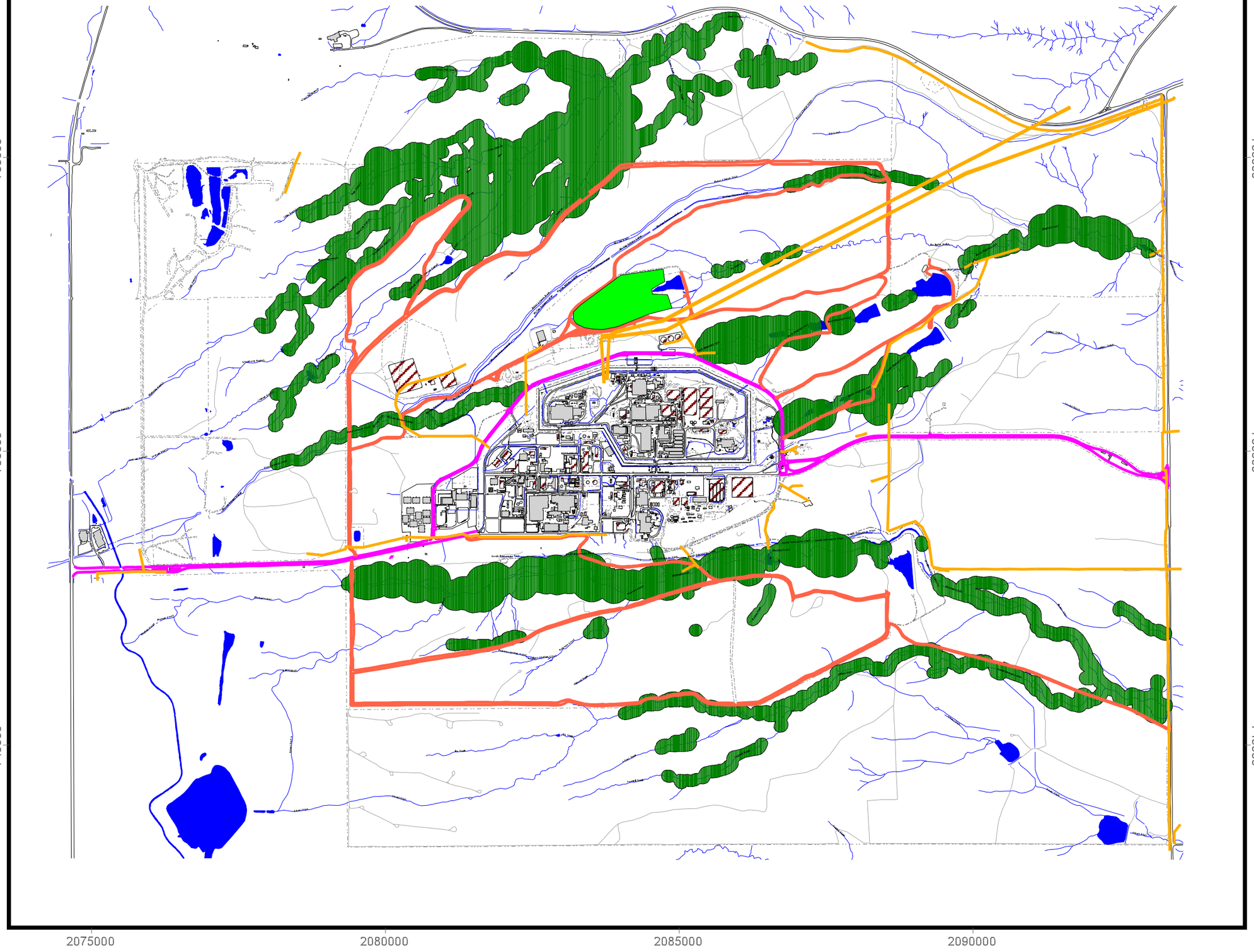
Programmatic Biological Assessment
Part I Projects - 1

Figure 6



Legend

- Present Landfill Area
- Roadside Grading and Roadside Mowing Locations
- Roadside Mowing Only
- Powerline Removals

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

1000 0 1000 2000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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For: Kaiser-Hill Company, LLC

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MAP ID: 04-0014

January 22, 2004

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Programmatic Biological Assessment
Part I Projects - 2

Figure 7

Projects

1 - Dirt Pile along Walnut Creek
2 - Gravel/Riprap Storage Area
3 - Solar Pond Groundwater Treatment Cell
4 - Solar Pond Water Outflow Pipe
5 - East Trenches Groundwater Treatment Cell and Pipe
6 - B-4 Pond Building
7 - Mound Groundwater Treatment Cell and Pipe
8 - C-1 Pond Riprap Pile

2075000 2080000 2085000 2090000

755000 750000 745000

Legend

- Above Ground Pipelines
- South Interceptor Ditch
- Guardrails
- Project Locations

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
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N

500 0 500 1000 1500 Feet

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January 22, 20

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